



DATA ANALYTICS

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Contents Page

Part 1 – EXCEL

1. Introduction.....	2
2. Recognising the problem.....	4
3. Defining the problem.....	4
4. Structuring the problem.....	4
5. Analysing the problem.....	5
6. Interpreting results and making a decision	6
7. Implementing the solution.....	7
8. Conclusion Spreadsheet.....	8
9. Data Mining Weka.....	9
10. Data Mining Process: CRISP-DM	10
11. Model for Staging the Analytics Process Prediction Classification.....	10
12. Model for Staging the Analytics Process Prediction Regression	12
13. Model for Staging the Analytics Process Clustering Outliers.....	13
14. Model for Staging the Analytics Process Association Sequence Analysis.....	14
15. Conclusion WEKA	15
16. General Conclusion	16
17. Reference	17
18. Appendix Spreadsheet	18
19. Conclusion Appendix WEKA	37

Introduction

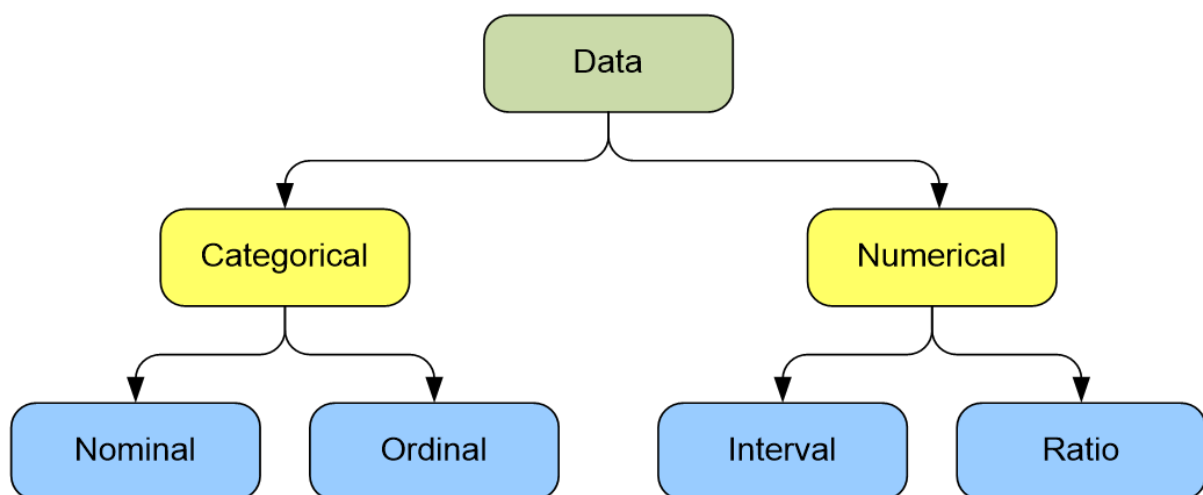
This paper will be critically evaluating the Canada Superstore Sales.xls data, by using the Spreadsheet Modelling and WEKA Modelling Processes. The paper will analyse and explore the supplied data, by Data Mining (DM) to determine why Canada Stores is making loss.

(Oakshott, 1997) suggested that A Model is a ‘simplified representation of a system’ therefore, the models will be designed to represent some aspects of the Canada Superstores Data. Graphs and Charts will be used to visualize and to understand the system we build, by using Mathematical, such as rules, quantity, numbers, algebra, etc. (Ragsdale, 2001). Ragsdale, (2001) further proposed the benefits of Modelling as less costly to analyse decision problems, models do deliver needed information and models can be used to do things that would be impossible. Models is very useful as it gives us insight and understanding that improves decision making.

(Edwards & Finlay, 1997) Discoursed the three main components of Spreadsheet, they are

- Logic Model
- Data Model
- Presentation Model. See Appendix 33 for more.

Fig 1 shows types of spreadsheet Data.



(Sharda, et al., 2014a)

One major objectives of computerized decision support are to facilitate closeness between the current organisation's performance and desired performance (Sharda, et al., 2014). These tools will be used to determine Patterns, that is a mathematical (numeric and/or symbolic) relationship among data items. To describe, prescribe or to make any prediction for Canada Superstores, the data must go through the Modelling cycle.

These Models can be prescriptive, descriptive and predictive. See the Fig 2 Below.

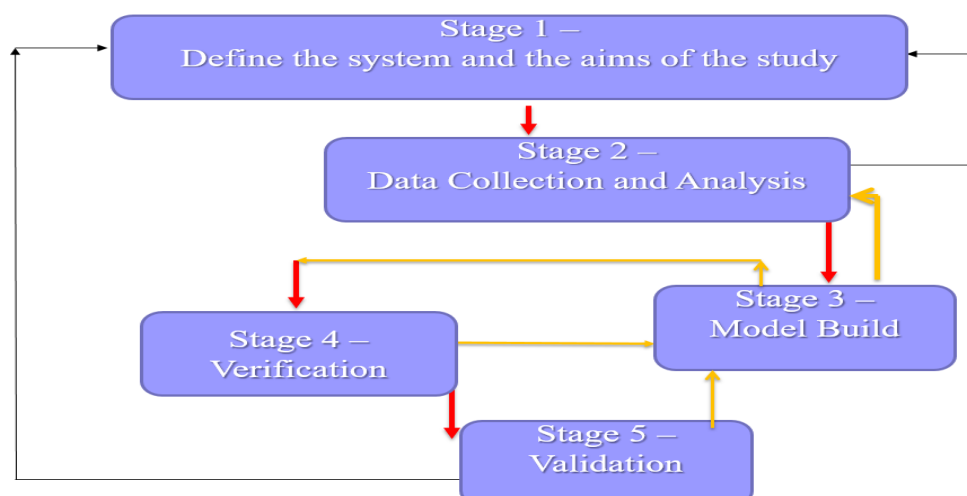
Fig 2

Categories of Mathematical Models

Model Category	Form of $f(\cdot)$	Independent Variables	OR/MS Techniques
Prescriptive	known, well-defined	known or under decision maker's control	LP, Networks, IP, CPM, EOQ, NLP, GP, MOLP
Predictive	unknown, ill-defined	known or under decision maker's control	Regression Analysis, Time Series Analysis, <u>Discriminant</u> Analysis
Descriptive	known, well-defined	unknown or uncertain	Simulation, PERT, Queuing, Inventory Models

Cliff Ragsdale. © 2001 South-Western/Thomson Learning.

The 5 Stage Modelling Cycle



(Ragsdale, 2001)

Model for Staging the Analytics Process

Evans, (2012) suggested the models for staging the analytic process:

1. Recognising the problem

Therefore, having critically viewed the available Canada Superstore Data (CS), and determining how to use the data, then the data may be able to shed some light to the company was losing money on some products.

2. Defining the problem

Attempts must be made to determine why Canada Superstores is underperforming, and what are the contributing factors. The contributing factors may include

1. Price
2. Type of product
3. Season
4. Or geographical
5. Could there be an invoicing problem?

3. Structuring the problem

This stage involves cleaning the data to make a better sense of the data. Incomplete and missing data are removed or else the accuracy of the model may be affected. The first task conducted was to correct the errors on the dates.

1. The dates were showing errors, but they were normalised.
2. Over 220 items with incomplete product name in Tab 32 was deleted from the data set see Appendix 1
3. Tab 33, 63 items were deleted because they were without Product Base Margin and notably, they all belong to the same brand. see Appendix 2

Objectives

I want to achieve 12 objectives.

Therefore, the analysis must determine Why

- Is there a link between underperforming regions, provinces?
- Is there a connection between loss and price, and price review?
- Could there be a relationship between Order Priority and shipping and Rate of Return
- Is there any association between invoicing, price, profit, and Quarterly sales pattern?

- Will Forecasting, Weighted average, EQL and Prediction useful in stock management
- Critical items and Returned
- Top performing Regions, Profit by province and Regions, Lowest profit regions and province
- The sales pattern in 2016 sales and profit and Corporate and Small business
- Is Jumbo box viable?
- Relationship between item processed by Regions & bottom Sales Manager
- Relationship between priority shipping mode and order priority (critical & High), major audit, profit by shipping
- Is there a connection between Major local control audit, critical and returned & rate of return, Relationship between item processed by Regions & bottom Sales Manager?

Analysing the problem

Loss

It was discovered that there was some links between loss. The hypothesis to determine the profitability of prices was carried out in Tab 2 column Y, with formula `=IF(I2<0,"Loss making","profit")`. Out of 8114 items processed, 4187 were loss making, see Appendix 3. A total of 3770 items was returning profits. Column Z of Tab 2 revealed items that needed price review. `=IF(AND(X7933="Loss making",J7933<100),"Price Review", "")`, the selected items must have had prices less than \$100. See Appendix 4 and Appendix Jumbo appendix 25

Returns

The returned items were matched in column AD, by using the formula `=IFERROR(VLOOKUP(B2,Returned_Order_id,2,FALSE), "")`. A total of 161 items that were returned were order priority critical in formulae `=COUNTIF(AG2:AG8115,"1")` out of 816 counted in the formulae `=COUNTIF(AD2:AD8115,"Returned")`, (Appendix 5-7).

In Tab 2, column AE, formulae `=IF(AD586="Returned", "Quality Check", "")`, was utilised to determine returned items that needed to be quality checked. The IF and VLOOKUP formulae was employed to determine major quality impact

`=IF(AE586="Quality Check",VLOOKUP(V588,Quality_Control,2), "")`. (Appendix 8 & 9).

Invoicing

Formulae `=E7648*J7648` was used to determine the probable invoice value and, formulae `=F8082-AH8082` (Appendix 10&11) was used to determine the discrepancies in the invoices.

Profit and sales

Various categories such as sales revenue, average sales, minimum sales, total sales, and discounts. See Appendix 12. Pivot table was used to identify the top 3 selling regions, top 4 region by profit, top 10 Profit by Province, see Appendix 13-15. To determine profitability by Lowest profit by Province / product category, lowest profit by region/product category see Appendix 16-17.

Forecasting

The summary of Appendix 18-21 helps to forecast, the equation and trend, moving averages - 3 period moving average, Weighted moving averages 3 period moving average and Economic Order Quantity Model. Based on Year 2016, technology, office equipment.

Corporate and Small business

The output in Appendix 22- 24 revealed a perfect relationship between the Corporate and Small Business. The 2016 sales and Sales pattern over 4 years revealed a summer time pattern.

Relationship

The output of priority shipping mode and order priority (critical & High), major audit, profit by shipping revealed a relationship. Appendix 26&27.

Audit & Critical and Returned

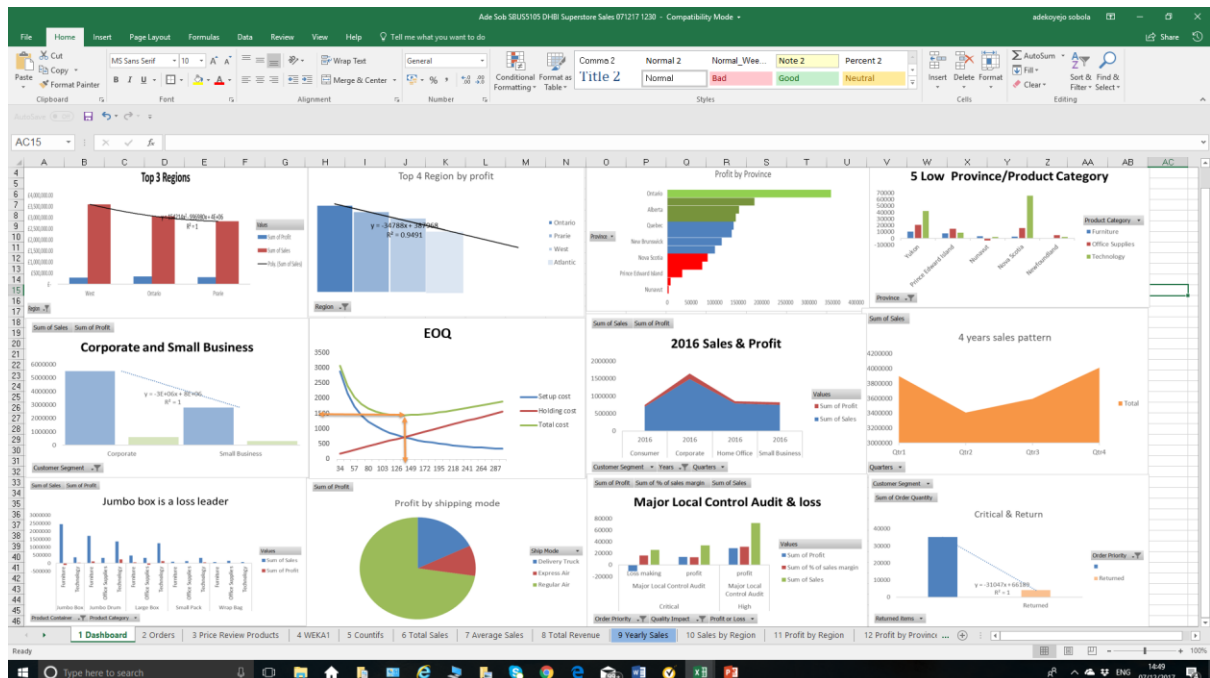
The summary of outputs among Major local control audit, critical and returned & rate of return see Appendix 28-29& 32

The summary of the output item processed by Regions & bottom Sales Manager see Appendix 30&31.

Interpreting results and making a decision

The Models on the Dashboard beneath, cannot fully capture every detail of the sales problem at Canada Superstore. Some summary models have been depicted by graphs, tables, and placed in the Dashboard.

Dashboard



(Sobola, 2017)

1. In the Top 3 selling Regions, there is a perfect Sales trendline between the top 3 regions as $R^2=1$, this is the best result based.
2. Similarly, top 4 selling Province achieves $R^2=0.9491$, this a great result.
3. There is a relationship between Profit by Region and profit by Province. Ontario especially is performing very high in Region and Province. And the low performing regions and provinces are similar.
4. The usual underperforming Provinces unsurprisingly are underperforming on three product categories. $R^2=1$
5. However, there is a perfect trendline between Corporate and Small Business customers.
6. The Economic Order Quantity (EOQ) is the number of units that a company should add to inventory with each order to minimize the total costs of inventory, such as holding costs, order costs, and shortage costs. Therefore, to minimise cost, the order ordering more units each time. This continues, in fact, until ordering and setup cost equals holding cost. At this point, the total cost curve reaches its minimum. 138 is the Optimal Order Quantity, Q^* for Year 2016, technology, office equipment. The moving average is forecasting 203 orders in the net period.
7. Although, the 2016 graph confirms the corporate customers as most profitable, sales between Small business and Home businesses were so close. More need to be done to increase the small business sales.
8. The 4-year graph revealed a low sale pattern in the summer, sales was generally down in the second and third quarters of the year.
9. The jumbo box is shown as a loss maker, and the spreadsheet hypothesis clearly revealed a connection between Jumbo Box and specifically to furniture.

10. Graph 10 reveals that products shipped via a Regular Air as most profitable.
11. Graph 11's hypothesis confirms that the only 12 items met this criterion, but the graph exaggerates the finding.
12. In graph 12, there was a perfect trend line between critical priority and items returned.
13. The countif function further revealed that out of 816 returns, 161 was Critical priority that was 20%.

Implementing the solution

1. After, the price to sales figure analysis revealed a discrepancy in invoicing, the Data scientist is advised to investigate why only 8 invoices were accurate out of 8114 invoices. The top 3 regions and provinces are selling well, efforts should be made to increase sales of other regions and provinces. The top 3 regions are 68% of Sales. Appendix 12. The 2 underperforming Provinces should be reviewed as sales generated are too little.
2. There was a perfect trendline between the Corporate and Small Business customers, sales effort could be targeted at these two as the sales and marketing effort may produce similar result. The sales effort could be extended to the Home business because of its similarities with Small business.
3. On material forecasting for office equipment under technology category, the EOQ level is 138.
4. The quarterly graph revealed a slump in sales in Qtr. 2 and Qtr. 3 respectively, advisement or other sales drive may be employed to boost sales.
5. Generally, the Jumbo box especially for furniture is connected to loss of profit, the organisation may review the Jumbo box.
6. All items with incomplete product name are Technology category, Telephones and Communication sub category, and small box needs reviewing.
7. All the 63 products without product margins were supplied by SAFCO, purchase price needs to be reviewed.
8. The items classified as Critical and High priority are the most valued customers, they are involved in sale: Critical at 1553 and High at 1707. Both are classified as Class A client. Appendix 12.
9. As 20% of returns was a critical priority, the Data, Scientist may want to investigate further. The $R^2=1$, there was a perfect linear relationship between the Critical and Returns.

Conclusion

The spreadsheet has enable the modelling for Canada Superstore's large data. The strength of spreadsheet for decision making provides a flexible modelling environment for manipulating data, to develop and solve models. It, further allows the modification of spreadsheet appearance, therefor, many areas have been highlighting for the data scientist to further investigate so that Canada superstores can become mere profitable (Evans, 2012).

See Appendix 34 for benefits of Spreadsheet.

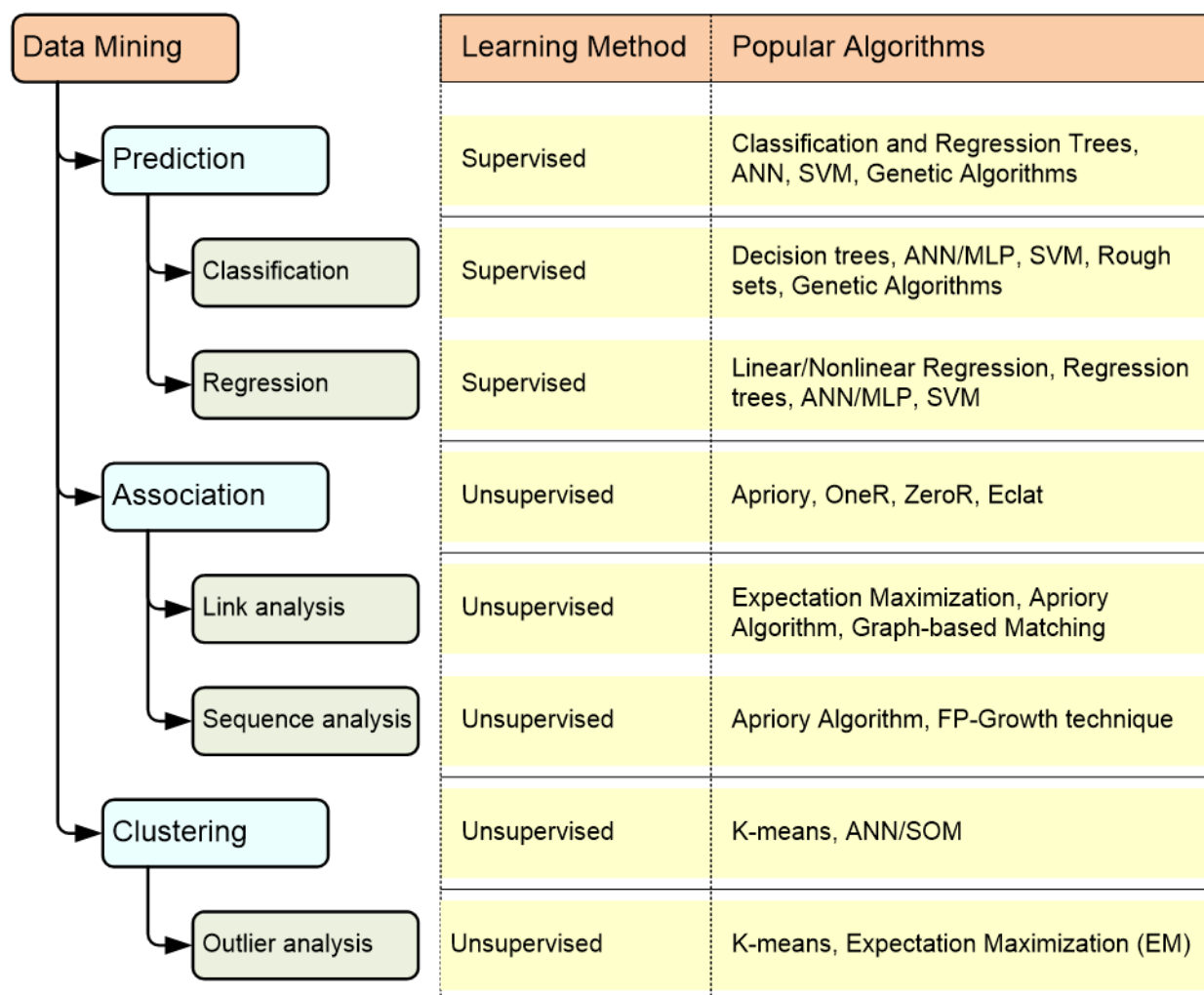
Part 2

Part II – Use of Weka to analyse the data

DM ‘The non-trivial process of identifying valid, novel, potentially useful, and ultimately understandable patterns in data’ (Fayyad, et al., 1996). This paper will seek and derive information and knowledge from the supplied data. The DM therefore, must go through a data mining process to determine a mathematical pattern. CRISP-DM is a cross-industry standardized process of conducting DM projects. Which is a sequence of six steps (Sharda, et al., 2014). Fig 1 & fig 2 shows the CRISP-DM process.

FIG 1

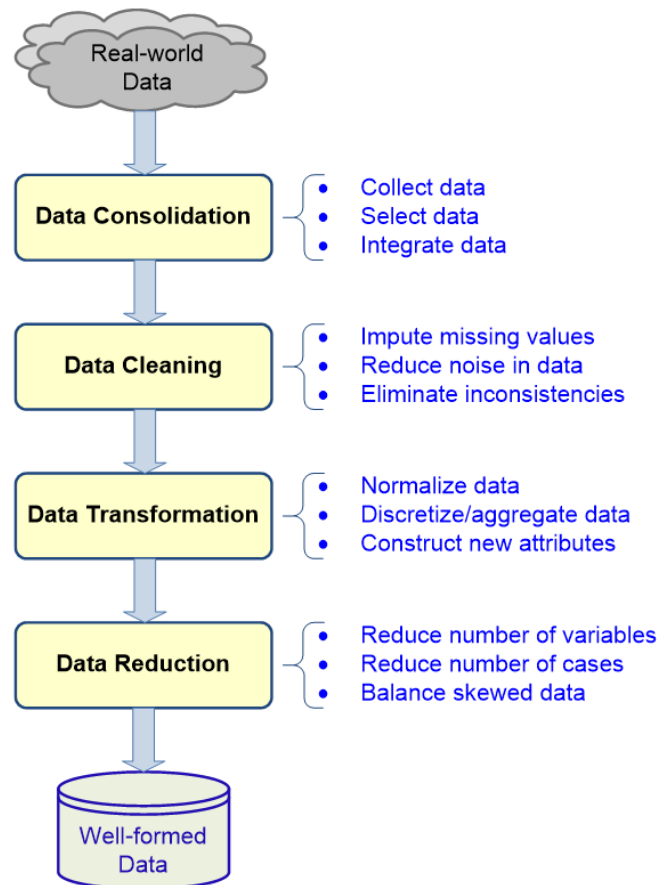
A Taxonomy for Data Mining Tasks



(Pearson Education Limited 2014a)

Fig 2

Data Preparation – A Critical DM Task



(Sharda, et al., 2014b)

Prediction Classification

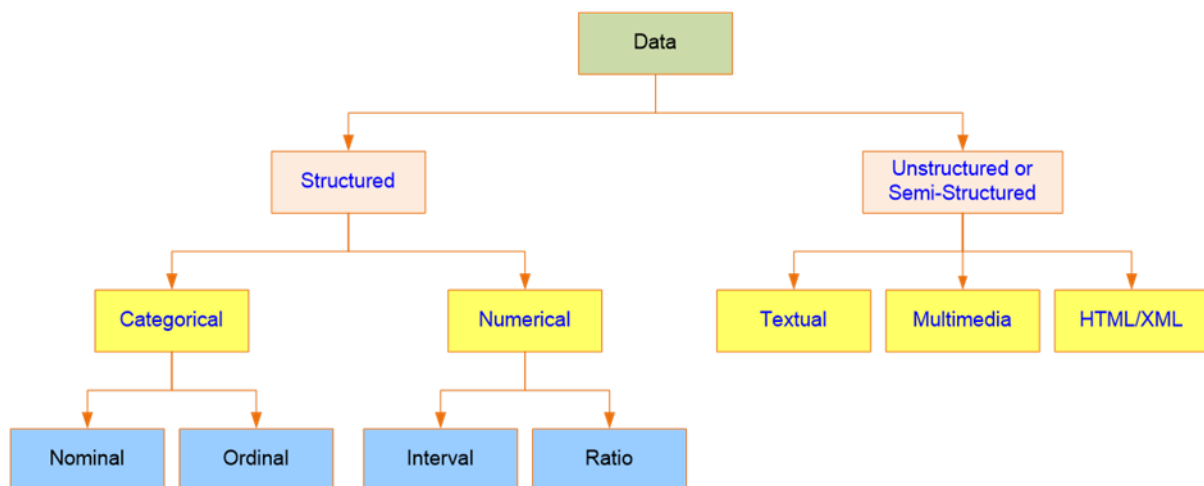
1. Business Understanding

In the spreadsheet, it was found out there was a relationship between the Corporate and small businesses., top 3 regions account for more than 68% of sales, and the business is losing money on many products. Categorical ordinal data will be used in the decision tree. Besides, not that every attribute in the data set will be used to analyse the data. Fig 2 beneath shows type of Data.

2. Data Understanding

This stage is about Pre-processing, that is cleaning the data. This decision tree Tool likes data in a very structured format, so any anomalies, noisy data or outliers, blanks and inconsistencies are eliminated. As explained in the Spreadsheet, items such as products with incomplete names, product without base margins were removed, dates were normalised.

Fig 3



(Pearson Education Limited board, 2014b)

3. Data Preparation

(Sharda , et al., 2014) suggested tools to use for DM. A taxonomy.

For applying a decision tree, certain columns of the data set are ideal for prediction DM approach, classification method. For inclusion in a prediction data mining approach using a classification supervised method. For classification, only 4 columns will be selected these are Order Quantity, Sales, Profit, and Profit or Loss.

4. Models

The Data Mining Process: CRISP-DM model here is to classify the data into s a decision tree. DM extract patterns from data. Prediction Classification Method will be applied first. It requires a supervised data, and supervised is when the inputs and outputs are known. Many algorithms are available to build a decision a tree.

The Algorithm to be used are J48 Algorithm, LMT, RandomTree, RandomForest, REPTree, BFTree, IBK, SimpleCart. J48 the core algorithm for building decision trees called ID3 by (Quinlan, 1992) which employs a top-down method. See the result in Appendix 1.

5. Testing and Evaluation

Decision tree the J48 and other algorithms are used.

Algorithms	Correct classification	Confusion Matrix		Appendix	Appendix for Tree	
		Loss making	Profit			Rules
J48	99.8028%	4187	3911	1	2	8098
RandomForest	99.87%	4186	3927	3		8113
RandomTree	99.9877%	4187	3926	4	5	8114
IBK	100%	4187	3927	6		8114
NiaveBayes	60.5004%	3947	2965	8		8114

6. Deployment

Decision Tree Outputs

From the result of the algorithms used the Prediction classification technique, the Tree J48 has 2 leaves, 45 is the RandomTree size. The IBK output is 100% accurate. NiaveBayes percentage of accuracy deviates greatly from the other algorithms. The rest algorithm has over 99% accuracy the confusion matrix of each one was similar. Both the false positives and false negatives area similar J48, RandomTree, RandomForest, REPTree but slightly different from the NiaveBayes. The top 4 looks like a good model at over 90%. Nonetheless, the trees created did not offer over much compared to the Models.

Prediction Regression method

Prediction Regression is a DM method for prediction problems where the predicted output is numeric. It is a supervised learning method (Sharda , et al., 2014)

Step 3. Data Preparation

Regression model can be as easy as one input variable and one output variable and this is a supervised learning method. Ordinal data/ numerical data will be used for this Linear DM algorithms. Steps 1 and 2 of Data Mining Process: CRISP-DM have been covered above. Moreover, not that every attribute in the data set will be used to analyse the data

Step 4. Models

The Linear Regression DM model will be built for Prediction Regression Model Appendix 9 & 10.

Step 5 Testing and Evaluation

The Linear Regression Model output correlation coefficient of 0.2107. The result of the Linear Regression Model shows $\text{Sales} = 52.5276 * \text{Order Quantity} + 390.35$

Step 6 Deployment

The model output is predicting increased in $\text{Sales} = 52.5276 * \text{Order Quantity} + 390.35$. The result is only useful for average sales because prices varies significantly, from \$2 to \$6000.

Clustering DM technique

Clustering divides a Database into different segments, and members of each segment share common attributes or similarities. This is unsupervised learning method, and Clustering is a useful DM tool, because it can quickly take data and turn it into groups, and conclusions can be made (Sharda , et al., 2014)

Step 3 Data Preparation

Clustering DM Outlier analysis technique utilise unstructured data, and in the data set, there are some unstructured data. Clustering makes it possible to model groups of data to determine patterns from the data. Whenever a data set is defined, then it is possible to determine a pattern from the data. One benefit of clustering is that every attribute in the data set will be used to analyse the data. Every attribute in the data set will be used to analyse the data. Line 2, 325 was also deleted and date column deleted, product name deleted, dates deleted see Appendix 13 for the remaining deleted items.

Step 4 Models

The K-means Model (SimpleKMeans) will be used for this unsupervised data Clustering DM Outlier analysis.

Step 5 Testing and Evaluation

Group 0 @ 35%, Group 1 @ 13%, Group 2 @ 8%, Group 3 @ 31% and Group 4 @ 12%

The result is shown in Appendix 11 & 12

Step 6 Deployment

Group 0 Corporate is the most valuable customer segment, and closely followed by group 3 the Home Office, the Corporate's order priority is medium, sales to the group is profitable, they have the cheapest shipping cost, and they regularly buy office supplies. Their shipping order days is more than two days and they use a regular Air as shipping mode.

Association DM.

Association is a category of DM algorithms that establishes relationships about different items that occur simultaneously in each record or period. The Association DM is an unsupervised learning method, and the algorithm method utilised is sequence analysis model (Sharda, et al., 2014). Association DM is a sequence analysis unsupervised technique, and the algorithm model for building is Apriory. It is a very popular DM method in business as it finds the relationships between variables. The association rule learning method is very well known and very efficient (Agrawal & Srikant, 1994). The algorithm is simple, and it builds up attribute-value (item) sets that maximize the number of instances that can be explained. It utilises data with binaries attributes and the intention is to find connected item or orders. It will be interesting to finding useful patterns in this data that may or may not be related to the predicted attributed.

Step 3 Data Preparation

The data is cleaned at this pre-process stage. The data has been normalised, and categorised.

Step 4 Models

The Apriory algorithm Model will be utilised to build the Association Sequence Analysis.

Step 5 Testing and Evaluation

The Association algorithm output presented 10 rules learned from the supermarket dataset. The algorithm output contains 8114 instances, 9 attributes and gives a 0.95 minimum support.

Step 6 Deployment

You can see rules are presented in antecedent => consequent format. The number associated with the antecedent is the absolute coverage in the dataset (in this case a number out of a possible total of 8114. The cut off of 90% was used in selecting rules, mentioned in the Association output and indicated in that no rule has a coverage less than 0.90. the output is meaningless as the association like rule 1 small box=large box is useless association.

Conclusion WEKA

In the CRISP-DM methods used, there is need to interpret the patterns and conclusions that our model tells us. WEKA will only use columns that statistically contribute to the accuracy of the model (measured in R-squared, but beyond the scope of this article). Clustering is a useful DM tool, because it can quickly take data and turn it into groups, and conclusions can be made. The math behind WEKA is very complex and sometimes the process is highly repetitive and experimental. Whereas, classification and regression produce output of variable that leads to easy conclusions, Clustering requires careful observation of the output and then draw a conclusion.

In relation to Canada Superstores, the Prediction Classification Decision Tree Outputs gives over 98% accuracy and it confirms the total number loss and profit-making orders. Furthermore, the Prediction Regression method predicting the sales price, the price is not useful this time, but it could be useful as an average price. The company has varied prices for various items. Nonetheless, the Clustering DM technique revealed the most viable client segment, the Corporate, it further revealed why this segment was the valuable. However, the output for the Association DM is meaningless currently.

These tools are very useful if used right. Like the clustering depends on the user because problem solving in organisations could be subjective, human biases need be eliminated or reduce with Business Analytics because many business problems are less structured and not easily solved. (Post & Anderson, 2006). Nonetheless, Analytics builds on historical data and considers changing conditions to arrive at fact-based solutions that decision makers might not have considered. Analytics are to aid in objective decision making, by analysing past data, therefore DM is not just about the input-output, it is about identifying patterns and rules that area useful in predicting a future output, and the conclusions must be backed by the data (Sharda, et al., 2014). Therefore, DM must improve the efficiency and effectiveness of decision making by managers by increasing effectiveness and efficiencies of business decision making.

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APPENDICES Spreadsheet

Appendix 1

Index name		Sales	Discount	Net Profit	Unit Price	Customer Name	Province	Region	Product Name	Product Sub-Category	Product Name	Unit	Cost	Base Price	Ship Date	% of Sales	% of Sales Ship-order	Profit or L	Review	Return	Rev	Order ID	Status
1	der Product	4	700.366	0	Regular A	-797.70	295.99	5.89	John Cash Ontario	Ontario	Consumer Technology/Telephones and Communication	2085	Small Box	0.59	24/07/2013	0.00%	41322	3	Loss maki			29380	Returned
2	der Product	4	446.365	0.03	Regular A	-740.41	175.99	8.99	Nail Franc Saskatchewan	Ontario	Consumer Technology/Telephones and Communication	2180	Small Box	0.57	31/12/2015	0.00%	295.57	5	Loss maki			32999	Returned
3	der Product	5	945.014	0.01	Express A	-453.40	195.99	4.2	Patch Jol Nova Brunswick	Quebec	Consumer Technology/Telephones and Communication	188	Small Box	0.6	23/09/2014	0.01%	507.37	4	Loss maki			37962	Returned
4	der Product	7	1128.480	0.00	Regular A	-557.95	195.99	4.2	Tom Shive Quebec	Quebec	Consumer Technology/Telephones and Communication	888	Small Box	0.6	26/01/2015	0.01%	675.89	31	Loss maki			46375	Returned
5	der Product	3	337.3395	0	Regular A	-509.84	125.99	2.5	Paul Prost Saskatchewan	Quebec	Consumer Technology/Telephones and Communication	5182	Small Box	0.59	15/01/2013	0.00%	199.03	2	Loss maki			50501	Returned
6	der Product	4	430.480	0.06	Regular A	-452.77	125.99	5.83	Jula Durt Manitoba	Prince	Consumer Technology/Telephones and Communication	7290	Small Box	0.6	27/12/2014	0.00%	290.51	3	Loss maki			51079	Returned
7	der Product	5	503.3275	0.06	Regular A	-488.31	125.99	5.83	Jim Radio Northwest	Ontario	Consumer Technology/Telephones and Communication	6290	Small Box	0.6	21/05/2015	0.00%	302.00	4	Loss maki			52068	Returned
8	der Product	3	306.6205	0.06	Express A	-470.08	115.99	5.89	Cam Macdr Ontario	Ontario	Consumer Technology/Telephones and Communication	7160	Small Box	0.57	13/12/2013	0.00%	174.77	1	Loss maki			54339	Returned
9	der Product	5	616.1005	0.03	Regular A	-463.74	140.99	4.2	Nat Carol Ontario	Ontario	Home Office/Telephones and Communication	7160	Small Box	0.59	04/10/2013	0.00%	303.50	7	Loss maki			54339	Returned
10	der Product	8	1131.811	0.07	Regular A	-457.16	195.99	8.99	Rob Habi British Col West	Ontario	Consumer Technology/Telephones and Communication	A1228	Small Box	0.58	26/07/2013	0.01%	762.01	0	Loss maki			54563	Returned
11	der Product	7	771.793	0.06	Regular A	-449.53	140.99	4.2	Todd Boy Ontario	Ontario	Consumer Technology/Telephones and Communication	7160	Small Box	0.59	08/02/2015	0.01%	495.35	2	Loss maki			29766	Returned
12	der Product	9	1418.556	0.09	Regular A	-447.41	195.99	4.2	Christophe Alberta	West	Home Office/Telephones and Communication	7160	Small Box	0.6	28/11/2014	0.01%	691.37	7	Loss maki			55161	Returned
13	der Product	7	1278.647	0.01	Regular A	-386.17	200.99	4.2	Daren Bu Ontario	Ontario	Home Office/Telephones and Communication	2180	Small Box	0.59	11/11/2016	0.01%	754.40	2	Loss maki				
14	der Product	9	1208.515	0.06	Express A	-382.57	175.99	8.99	Justin Hirs Nova Scotia Atlantic	Quebec	Consumer Technology/Telephones and Communication	2180	Small Box	0.57	16/10/2013	0.01%	734.45	1	Loss maki				
15	der Product	2	125.273	0.02	Regular A	-301.91	65.99	8.99	Nadine Wil Manitoba	Prince	Consumer Technology/Telephones and Communication	8180	Small Box	0.58	03/02/2015	0.00%	70.15	2	Loss maki Price Rev				
16	der Product	8	736.2505	0.1	Regular A	-286.36	115.99	2.5	Scott Coar Quebec	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.57	01/06/2016	0.00%	420.80	1	Loss maki				
17	der Product	7	685.7205	0.08	Regular A	-278.87	115.99	2.5	Erica Smr Alberta	West	Small Box Technology/Telephones and Communication	6180	Small Box	0.57	01/02/2016	0.00%	390.86	5	Loss maki				
18	der Product	8	703.6485	0.06	Regular A	-277.78	115.99	5.26	Alex Aude British Col West	Ontario	Home Office/Telephones and Communication	636	Small Box	0.57	14/03/2014	0.01%	435.28	1	Loss maki				
19	der Product	1	61.088	0.02	Regular A	-257.72	65.99	5.82	Eric Murd Newfoundland Atlantic	Ontario	Home Office/Telephones and Communication	6220	Small Box	0.55	11/02/2016	0.00%	33.60	2	Loss maki Price Rev				
20	der Product	1	65.467	0.06	Express A	-257.41	65.99	8.99	Dave Por Ontario	Ontario	Consumer Technology/Telephones and Communication	7160	Small Box	0.58	01/11/2014	0.00%	37.97	1	Loss maki Price Rev				
21	der Product	5	284.6725	0.04	Express A	-247.24	65.99	8.99	Nat Steel Nova Scotia Atlantic	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.58	06/09/2014	0.00%	159.42	5	Loss maki Price Rev				
22	der Product	18	1297.448	0.04	Regular A	-421	85.99	10.78	Anna Gay Ontario	Ontario	Consumer Technology/Telephones and Communication	3395	Small Box	0.58	13/02/2014	0.01%	752.52	3	profit				
23	der Product	6	326.893	0.07	Regular A	-223.21	65.99	5.31	Mika Vito Nova Scotia Atlantic	Quebec	Small Box Technology/Telephones and Communication	3395	Small Box	0.57	19/06/2015	0.00%	186.33	0	Loss maki Price Rev				
24	der Product	7	369.0245	0.02	Regular A	-218.01	65.99	4.2	Harold De Quebec	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.59	06/08/2014	0.00%	217.13	3	Loss maki Price Rev				
25	der Product	12	1940.21	0.09	Regular A	-215.34	200.99	4.2	Alex Pyyo Quebec	Quebec	Consumer Technology/Telephones and Communication	2180	Small Box	0.59	22/02/2014	0.01%	1144.72	1	Loss maki				
26	der Product	7	373.2775	0.07	Regular A	-204.93	65.99	5.26	Benjamin Yukon	Yukon	Consumer Technology/Telephones and Communication	6880	Small Box	0.56	03/07/2014	0.00%	209.04	0	Loss maki Price Rev				
27	der Product	8	803.8045	0.06	Regular A	-201.49	65.99	7.83	Paul Shaw Alberta	West	Consumer Technology/Telephones and Communication	6180	Small Box	0.59	08/03/2014	0.00%	266.63	5	Loss maki Price Rev				
28	der Product	12	1098.149	0.09	Regular A	-182.97	115.99	5.82	Karl Brow Yukon	Yukon	Consumer Technology/Telephones and Communication	6880	Small Box	0.58	10/04/2014	0.01%	636.93	2	Loss maki				
29	der Product	8	820.284	0	Regular A	-180.20	115.99	2.5	Dorothy W Nunavut	Nunavut	Consumer Technology/Telephones and Communication	6180	Small Box	0.57	08/03/2014	0.01%	47.56	0	Loss maki				
30	der Product	9	884.1275	0.06	Regular A	-179.71	115.99	4.2	Craig Teet Nova Scotia Atlantic	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.58	20/10/2014	0.01%	495.11	1	Loss maki			28738	
31	der Product	14	2145.698	0.08	Regular A	-176.79	195.99	4.2	Shahid Sh British Col West	Quebec	Consumer Technology/Telephones and Communication	5878	Small Box	0.6	14/11/2014	0.01%	1287.42	2	Loss maki				
32	der Product	11	1154.938	0.04	Express A	-176.06	125.99	8.99	Thien Hen Yukon	Yukon	Home Office/Telephones and Communication	6178	Small Box	0.57	21/05/2015	0.01%	680.31	1	Loss maki				
33	der Product	7	394.2	0.05	Regular A	-164.46	65.99	2.5	Jane Craig British Col West	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.55	14/07/2015	0.00%	211.31	0	Loss maki Price Rev				
34	der Product	13	1255.497	0.1	Regular A	-161.12	125.99	3	Pete Amis Ontario	Ontario	Consumer Technology/Telephones and Communication	2730	Small Box	0.59	10/07/2016	0.01%	746.64	1	Loss maki			29766	
35	der Product	18	1341.963	0	Regular A	-160.78	85.99	2.78	Shahid Sh British Col West	Quebec	Consumer Technology/Telephones and Communication	6180	Small Box	0.58	13/11/2014	0.01%	776.34	1	profit				
36	der Product	10	568.3355	0.02	Regular A	-147.35	65.99	8.99	Heather H Northwest Northwest	Quebec	Home Office/Telephones and Communication	7290	Small Box	0.59	08/06/2014	0.00%	326.63	1	Loss maki Price Rev				
37	der Product	10	525.674	0.06	Regular A	-147.02	65.99	5.26	Dave Por Yukon	Yukon	Small Box Technology/Telephones and Communication	6880	Small Box	0.56	14/09/2015	0.00%	294.38	2	Loss maki Price Rev			29766	
38	der Product	11	817.219	0.03	Express A	-138.09	65.99	8.99	Sally Hagl Ontario	Ontario	Consumer Technology/Telephones and Communication	6280	Small Box	0.58	07/12/2015	0.00%	357.99	4	Loss maki Price Rev				
39	der Product	11	818.1985	0.02	Regular A	-132.53	65.99	8.8	Joseph Al Ontario	Ontario	Consumer Technology/Telephones and Communication	6180	Small Box	0.58	28/11/2014	0.00%	388.95	7	Loss maki Price Rev				

Appendix 2

Product Base Margin																			
Product Name										Product Base Margin									
Region	Customer Segment	Product Category	Product Sub-Category	Product Name	Unit	Cost	Base Price	Ship Date	% of Sales	% of Sales Ship-order	Profit or L	Review	Revenue	Order ID	Status	Regions	Returned	Out	
Ontario	Corporate	Furniture	Tables	SAPFO PlanMaster Height-Adjustable Drafting Table Base, 43w x 30d x 30-37h, Bie, Jumbo Drm	Large Box	0.000000	0.12%	0.00	4.00	Loss maki			839	Returned	Enry/peter				
Ontario	Home Office	Furniture	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.01%	0.00	2.00	Loss maki Price Review			1685	Returned	AJ/peter				
Prince	Corporate	Furniture	Tables	SAPFO PlanMaster Height-Adjustable Drafting Table Base, 43w x 30d x 30-37h, Bie, Jumbo Drm	Large Box	0.000000	0.06%	0.00	1.00	Loss maki			3781	Returned	Willen/Pt				
Northwest	Corporate	Office Supplies	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.04%	0.00	2.00	Loss maki			2284	Returned	Willen/Pt				
NL	Corporate	Office Supplies	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.03%	0.00	1.00	Loss maki			2616	Returned	Enry/peter				
Ontario	Consumer	Office Supplies	Storage & Organization	SAPFO Bollfest Steel Shelving	Large Box	0.000000	0.01%	0.00	2.00	Loss maki			41215	Returned	AJ/peter				
Quebec	Small Business	Office Supplies	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.01%	0.00	2.00	Loss maki			49025	Returned	AJ/peter				
NL	Corporate	Office Supplies	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.02%	0.00	1.00	Loss maki			46326	Returned	AJ/peter				
Atlantic	Small Business	Office Supplies	Storage & Organization	SAPFO Commercial Wire Shelving, Black	Large Box	0.000000	0.02%	0.00	2.00	Loss maki					Sany/Pete				
Yukon	Consumer	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.01%	0.00	2.00	Loss maki Price Review					Willen/Pt				
NL	Corporate	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.01%	0.00	1.00	Loss maki Price Review					Willen/Pt				
Ontario	Consumer	Furniture	Bookcases	Safco Value Mate Steel Bookcase, Baked Enamel Finish on Steel, Black	Jumbo Box	0.000000	0.01%	0.00	2.00	Loss maki Price Review					AJ/peter	Returned	Out		
Quebec	Home Office	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.01%	0.00	2.00	Loss maki Price Review					AJ/peter	Returned	Out		
Ontario	Consumer	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.03%	0.00	2.00	Loss maki Price Review					Sany/Pete				
Quebec	Small Business	Furniture	Bookcases	Safco Value Mate Steel Bookcase, Baked Enamel Finish on Steel, Black	Jumbo Box	0.000000	0.01%	0.00	4.00	Loss maki Price Review					AJ/peter				
Corporate	Furniture	Chairs & Chairmats	SAPFO Folding Chair Traylly	Medium Box	0.000000	0.01%	0.00	1.00	Loss maki										
Prince	Corporate	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.00%	0.00	1.00	Loss maki Price Review					Willen/Pt				
West	Consumer	Furniture	Tables	SAPFO PlanMaster Height-Adjustable Drafting Table Base, 43w x 30d x 30-37h, Bie, Jumbo Drm	Large Box	0.000000	0.01%	0.00	2.00	Loss maki					Willen/Pt				
West	Small Business	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.01%	0.00	2.00	Loss maki					AJ/peter				
Atlantic	Small Business	Furniture	Bookcases	Safco Value Mate Steel Bookcase, Baked Enamel Finish on Steel, Black	Jumbo Box	0.000000	0.01%	0.00	2.00	Loss maki					Sany/Pete				
West	Consumer	Furniture	Chairs & Chairmats	Safco Contoured Stacking Chairs	Large Box	0.000000	0.01%	0.00	2.00	Loss maki					Willen/Pt				
West	Home Office	Office Supplies	Storage & Organization	Safco Mobile Desk Side File, Wire Frame	Small Box	0.000000	0.00%	0.00	2.00	Loss maki					AJ/peter				
Atlantic	Small Business	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.00%	0.00	1.00	Loss maki					Sany/Pete				
West	Corporate	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.01%	0.00	1.00	Loss maki					AJ/peter				
Corporate	Office Supplies	Storage & Organization	Storage & Organization	Safco Mobile Desk Side File, Wire Frame	Small Box	0.000000	0.00%	0.00	1.00	Loss maki									
West	Home Office	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.00%	0.00	2.00	Loss maki					Willen/Pt	Returned	Out		
Ontario	Consumer	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.01%	0.00	2.00	Loss maki					AJ/peter	Returned	Out		
Ontario	Home Office	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.01%	0.00	2.00	Loss maki					AJ/peter	Returned	Out		
Nunavut	Corporate	Office Supplies	Storage & Organization	Safco Mobile Desk Side File, Wire Frame	Small Box	0.000000	0.01%	0.00	1.00	Loss maki					Enry/peter				
Prince	Corporate	Furniture	Tables	SAPFO Folding Chair Traylly	Medium Box	0.000000	0.01%	0.00	3.00	Loss maki					Willen/Pt				
West	Corporate	Furniture	Bookcases	SAPFO PlanMaster Height-Adjustable Drafting Table Base, 43w x 30d x 30-37h, Bie, Jumbo Drm	Large Box	0.000000	0.01%	0.00	2.00	Loss maki					Willen/Pt	Returned	Out		
West	Home Office	Office Supplies	Storage & Organization	Safco Value Mate Steel Bookcase, Baked Enamel Finish on Steel, Black	Jumbo Box	0.000000	0.02%	0.00	2.00	Loss maki					Willen/Pt				
West	Home Office	Office Supplies	Storage & Organization	Safco Mobile Desk Side File, Wire Frame	Small Box	0.000000	0.01%	0.00	2.00	Loss maki					Willen/Pt				
Yukon	Consumer	Office Supplies	Storage & Organization	Safco Mobile Desk Side File, Wire Frame	Small Box	0.000000	0.01%	0.00	1.00	Loss maki					AJ/peter				
Prince	Corporate	Furniture	Chairs & Chairmats	SAPFO Optional Arm Kit for Workspace® Cabbage Stacking Chair	Medium Box	0.000000	0.02%	0.00	4.00	Loss maki					Willen/Pt				
Atlantic	Corporate	Furniture	Chairs & Chairmats	Safco Folding Chair Traylly	Medium Box	0.000000	0.02%	0.00	2.00	Loss maki					Sany/Pete				
Ontario	Home Office	Furniture	Chairs & Chairmats	SAPFO Folding Chair Traylly	Medium Box	0.000000	0.02%	0.00	2.00	Loss maki					AJ/peter				
Quebec	Small Business	Office Supplies	Storage & Organization	Safco Industrial Wire Shelving	Large Box	0.000000	0.02%	0.00	2.00	Loss maki Price Review					AJ/peter				
Quebec	Home Office	Furniture	Chairs & Chairmats	Safco Folding Chair Traylly	Medium Box	0.000000	0.02%	0.00	1.00	Loss maki					AJ/peter				
Ontario	Corporate	Furniture	Chairs & Chairmats	SAPFO Folding Chair Traylly	Medium Box	0.000000	0.03%	0.00	2.00	Loss maki					AJ/peter	Returned	Out		

Adekoyejo Sobola (1601748)
DATA ANALYTICS

Appendix 3

Ade 5 SBUS105 DnB Superstore Sales 041217 1000 - Compatibility Mode -																			
adekoyejo sobola																			
X7958 - =IF(7958<0,"Loss making","profit")																			
Product Name																			
Product Base Margin																			
Ship Date % of Sales Ship-order Profit or Loss Review Revenue Order ID Status Regions Manager																			
2	Polycorn ViewStation ISDN Videoconferencing Unit	Large Box	0.39	14/03/2013	0.13%	4	Loss making			33004.21	85	Returned	Willam/Peter						
3	Polycorn ViewStation ISDN Videoconferencing Unit	Large Box	0.39	19/10/2013	0.14%	2	Loss making			32240.71	69	Returned	Willam/Peter						
4	Polycorn ViewStation ISDN Videoconferencing Unit	Large Box	0.39	28/11/2015	0.15%	1	Loss making			33328.42	134	Returned	Willam/Peter						
5	Canon imageCLASS 2280 Advanced Copier	Large Box	0.37	08/02/2015	0.02%	2	Loss making			15294.96	135	Returned	Willam/Peter						
6	Canon imageCLASS 2280 Advanced Copier	Large Box	0.37	04/03/2013	0.03%	2	Loss making			15294.96	230	Returned	Samy/Peter						
7	Riverside Palau Royal Layens Bookcases, Royale Cherry Finish	Jumbo Box	0.62	07/01/2013	0.19%	1	Loss making			37142.44	324	Returned	Willam/Peter						
8	Polycorn ViewStation ISDN Videoconferencing Unit	Large Box	0.39	14/09/2014	0.14%	2	Loss making			29253.41	359	Returned	Willam/Peter						
9	Riverside Palau Royal Layens Bookcases, Royale Cherry Finish	Large Box	0.62	13/12/2016	0.17%	1	Loss making			33959.52	612	Returned	Em / peter						
10	Canon imageCLASS 2280 Advanced Copier	Large Box	0.37	03/10/2016	0.19%	1	Loss making			22753.41	614	Returned	Willam/Peter						
11	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	09/07/2015	0.07%	2	Loss making			17734.04	678	Returned	Willam/Peter						
12	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	19/01/2014	0.07%	1	Loss making			18761.08	710	Returned	Willam/Peter						
13	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	24/03/2016	0.02%	1	Loss making			11313.00	740	Returned	Willam/Peter						
14	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	05/09/2013	0.02%	1	Loss making			11331.39	775	Returned	Willam/Peter						
15	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	14/04/2013	0.03%	2	Loss making			12335.69	833	Returned	Willam/Peter						
16	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	30/07/2013	0.09%	2	Loss making			18965.07	862	Returned	Willam/Peter						
17	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	12/04/2016	0.02%	1	Loss making			8271.34	930	Returned	Willam/Peter						
18	Polycorn ViewStation Adapter H23 Videoconferencing Unit	Medium Box	0.57	04/10/2013	0.03%	2	Loss making			14558.11	1061	Returned	Willam/Peter						
19	Polycorn ViewStation Adapter H23 Videoconferencing Unit	Medium Box	0.38	04/01/2016	0.03%	1	Loss making			8512.96	1127	Returned	Willam/Peter						
20	Lexmark 4227 Plus Dot Matrix Printer	Jumbo Drum	0.55	02/12/2016	0.04%	2	Loss making			10810.42	1295	Returned	Willam/Peter						
21	Lexmark 4227 Plus Dot Matrix Printer	Jumbo Drum	0.55	06/01/2013	0.04%	2	Loss making			10819.31	1382	Returned	Willam/Peter						
22	Lexmark 4227 Plus Dot Matrix Printer	Jumbo Drum	0.55	22/07/2013	0.01%	2	Loss making			6533.96	1538	Returned	Willam/Peter						
23	Bretford CR4500 Series Slim Rectangular Table	Large Box	0.62	01/05/2014	0.09%	2	Loss making			17090.99	1538	Returned	Willam/Peter						
24	Canon FC1680 Personal Laser Copier	Large Box	0.41	30/11/2013	0.15%	2	Loss making			25205.58	1621	Returned	Willam/Peter						
25	Okidata Pacemaker 4410N Wide Format Dot Matrix Printer	Jumbo Box	0.57	03/06/2016	0.15%	2	Loss making			25392.07	2050	Returned	Willam/Peter						
26	Polycorn ViewStation Adapter H23 Videoconferencing Unit	Medium Box	0.38	31/10/2016	0.01%	3	Loss making			5950.19	2052	Returned	AJ / peter						
27	Polycorn ViewStation Adapter H23 Videoconferencing Unit	Medium Box	0.38	20/04/2016	0.01%	2	Loss making			5956.61	2055	Returned	Willam/Peter						
28	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	17/09/2013	0.10%	1	Loss making			18477.16	2146	Returned	AJ / peter						
29	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	18/04/2013	0.18%	2	Loss making			18603.02	2213	Returned	Willam/Peter						
30	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	03/10/2016	0.03%	2	Loss making			8968.44	2248	Returned	Willam/Peter						
31	Chromcraft Bull-Nose Wood 48" x 96" Rectangular Conference Table	Jumbo Box	0.66	14/06/2016	0.10%	2	Loss making			17324.41	2530	Returned	Samy/Peter						
32	Lexmark 4227 Plus Dot Matrix Printer	Jumbo Drum	0.55	04/07/2015	0.08%	2	Loss making			12122.03	2533	Returned	Willam/Peter						
33	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	13/02/2013	0.03%	2	Loss making			20034.29	2562	Returned	AJ / peter						
34	Bush Advantage Collector Round Conference Table	Jumbo Box	0.73	25/04/2013	0.07%	2	Loss making			12934.49	2823	Returned	AJ / peter						
35	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	04/04/2014	0.01%	1	Loss making			4841.29	2915	Returned	Willam/Peter						
36	Office Star Contemporary Task Chair with 2-way adjustable arms, Plum	Jumbo Drum	0.78	06/03/2015	0.04%	2	Loss making			18619.23	3300	Returned	Willam/Peter						
37	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	18/12/2016	0.01%	2	Loss making			4953.11	3456	Returned	Willam/Peter						
38	Lesco Sheffield Collection Coffee Table, End Table, Center Table, Corner Table	Large Box	0.68	24/12/2013	0.02%	1	Loss making			5916.97	3525	Returned	AJ / peter						
39	Canon imageCLASS 2280 Advanced Copier	Large Box	0.37	16/07/2013	0.03%	1	Loss making			6710.22	3591	Returned	Willam/Peter						
40	Hi Conference Table	Jumbo Box	0.69	27/07/2014	0.02%	1	Loss making			6272.11	3687	Returned	Willam/Peter						
41	Epson DPX-8500 Dot Matrix Printer	Jumbo Drum	0.57	11/12/2016	0.04%	2	Loss making			9066.72	3777	Returned	Willam/Peter						
42	Hi Conference Table	Jumbo Box	0.72	15/11/2016	0.02%	2	Loss making			4993.56	4036	Returned	Samy/Peter						

Appendix 4

Ade 5 SBUS105 DnB Superstore Sales 041217 1000 - Compatibility Mode -										adekoyejo sobola									
File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do										adekoyejo sobola									
MS Sense Test										adekoyejo sobola									
Conditional Format as Formatting										adekoyejo sobola									
Title 2 Normal Bad Good Neutral										adekoyejo sobola									
Calculation Check Call Explanatory Followed by Hyperlink										adekoyejo sobola									
Styles										adekoyejo sobola									
Cells										adekoyejo sobola									
Editing										adekoyejo sobola									
Sort & Find Filter & Select										adekoyejo sobola									
Y1										adekoyejo sobola									
Review										adekoyejo sobola									
Product Name										adekoyejo sobola									
Product Base Margin										adekoyejo sobola									
Ship Date % of Sales Ship-order Profit or Loss Review Revenue Order ID Status Regions Manager										adekoyejo sobola									
7920	Hewlett-Packard Deskjet 1220Cse Color Inkjet Printer	Jumbo Box	0.36	27/05/2014	0.06%	3	profit			5370.85			Willam/Peter						
7920	Okidata M184 Turbo Dot Matrix Printers	Jumbo Drum	0.56	05/04/2016	0.10%	2	profit			10522.54			AJ / peter						
7920	Riverside Palau Royal Layens Bookcases, Royale Cherry Finish	Jumbo Box	0.62	18/06/2013	0.19%	4	profit			11760.29			Willam/Peter						
7920	Electra Halogen Magnifier Lamp	Medium Box	0.59	15/02/2013	0.06%	2	profit			5676.49			Willam/Peter						
7920	Canon MP101N Printing Calculator	Small Box	0.38	09/11/2014	0.05%	1	profit			3801.24			Samy/Peter						
7920	Smead Adjustable Mobile File Trolley with Lockable Top	Small Box	0.58	02/06/2014	0.07%	0	profit			7336.39			Willam/Peter						
7920	Brother DCP1000 Digital 3 in 1 Multifunction Machine	Large Box	0.55	23/11/2015	0.08%	1	profit			7630.44			AJ / peter						
7920	Okidata M1290 Turbo Dot Matrix Printers	Jumbo Drum	0.56	25/09/2013	0.09%	9	profit			9622.81			Willam/Peter						
7920	Multimedia Malters	Small Box	0.39	02/01/2015	0.05%	2	profit			3563.65			Willam/Peter						
7920	Qyeston RF Keyboard	Small Box	0.49	21/10/2013	0.06%	2	profit			4829.21			Willam/Peter						
7920	Global Leather Task Chair, Black	Jumbo Drum	0.66	19/10/2016	0.03%	2	Loss making			4703.60			Willam/Peter						
7920	Kensington 7 Outlet MasterPeace Power Center	Small Box	0.56	27/06/2013	0.05%	2	profit			4361.32			AJ / peter						
7920	Bush® Cubix Conference Tables, Fully Assembled	Jumbo Box	0.6	07/11/2013	0.07%	2	profit			7257.64			Willam/Peter						
7920	Atlantic Metals Mobile 5-Shell Bookcases, Custom Colors	Jumbo Box	0.55	27/10/2014	0.09%	1	profit			9365.40			Samy/Peter						
7920	Latitude Advantage Folding Chairs, 4/Carton	Large Box	0.57	06/09/2013	0.07%	1	profit			6255.09			Willam/Peter						
7920	GBC DocuBind 208 Manual Binding Machine	Small Box	0.35	07/12/2015	0.05%	0	profit			4539.44			Samy/Peter						
7920	Dynal Level Single-Width Filing Carts	Small Box	0.59	18/12/2015	0.06%	4	profit			5230.82			Willam/Peter						
7920	Okidata M1591 Wide Format Dot Matrix Printer	Jumbo Drum	0.56	19/12/2015	0.11%	1	profit			12632.04			Willam/Peter						
7920	Hon Deluxe Fabric Upholstered Stacking Chairs, Rounded Back	Jumbo Drum	0.55	18/09/2014	0.09%	1	profit			8965.07			Samy/Peter						
7920	Luxo Professional Fluorescent Magnifier Lamp with Clamp-Mount Base	Large Box	0.59	15/10/2015	0.07%	4	profit			664.87			Willam/Peter						
7920	Multimedia Malters	Small Box	0.39	09/11/2015	0.05%	1	profit			3730.71			Willam/Peter						
7920	Hon 4700 Series Modular Mid-Back Task Chairs with Adjustable Arms	Jumbo Drum	0.64	27/05/2016	0.12%	1	profit			15556.66			AJ / peter						
7920	Kensington 7 Outlet MasterPeace Power Center with Fax/Phone Line Protection	Small Box	0.55	27/01/2014	0.06%	2	profit			5339.96			Willam/Peter						
7920	Canon FC1680F Personal Copier	Large Box	0.55	23/11/2014	0.10%	1	profit			11087.59			AJ / peter						
7920	Chromcraft Bull-Nose Wood Oval Conference Tables & Bases	Jumbo Box	0.71	22/12/2015	0.19%	1	profit			2340.63			Samy/Peter						
7920	Sonyo 2.5 Cubic Foot Mid-Size Office Refrigerators	Jumbo Drum	0.59	03/06/2016	0.09%	0	profit			9365.40			Samy/Peter						
7920	Multimedia Malters	Small Box	0.39	11/12/2014	0.05%	2	profit			4315.44			AJ / peter						
7920	Hewlett-Packard Deskjet 1220Cse Color Inkjet Printer	Jumbo Box	0.36	17/10/2014	0.06%	3	profit			5370.85			Willam/Peter						
7920	Sheep AL-1530CSE Digital Copier	Jumbo Box	0.36	27/02/2013	0.07%	2	profit			1694.40			Willam/Peter						
7920	Breitbart CH4600 Series Slim Rectangular Table	Jumbo Box	0.62	08/01/2016	0.10%	2	profit			11411.60			Willam/Peter						
7920	Honover Wind Tunnel Plus Center Vacuum	Small Box	0.57	10/01/2016	0.08%	1	profit			4315.44			Willam/Peter						
7920	DMI Eclipse Executive Chair	Jumbo Box	0.66	25/03/2013	0.10%	0	profit			11008.86			Willam/Peter						
7920	Global Leather Executive Chair	Jumbo Box	0.55	13/05/2014	0.08%	2	profit			8249.63			AJ / peter						
7920	Pressacore DCP1000 Digital 3 in 1 Multifunction Machine	Jumbo Box	0.57	11/02/2013	0.09%	4	profit			8741.41			Willam/Peter						
7920	Latitude Advantage Folding Chairs, 4/Carton	Large Box	0.57	17/08/2015	0.07%	1	profit			6682.19			Samy/Peter						
7920	Benicks Non-Folding Utility Table with Steel Legs, Laminated Tops	Small Box	0.58	26/10/2015	0.03%	5	Loss making			420.11			Samy/Peter						
7920	Heyer Optima S6 V30 Internal Voice Modem	Small Box	0.51	30/10/2016	0.07%	1	profit			1407.05			Willam/Peter						
7920	Global Leather and Oak Executive Chair, Black	Jumbo Drum	0.56	25/02/2013	0.10%	2	profit			11168.05			AJ / peter						
7920	Global Troly Executive Leather Low-Back Chair	Jumbo Drum	0.6	08/01/2015	0.11%	2	profit			11426.70			AJ / peter						
7920	Electra Halogen Magnifier Lamp	Large Box	0.59	02/02/2013	0.08%	1	profit			4384.19			Willam/Peter						
7920	Global Troly Executive Leather Low-Back Chair	Jumbo Drum	0.6	11/12/2014	0.10%	2	profit			10773.60			Erny/Peter						
5 EQQ 6 Returns 7 Dashboard 8 incomplete Product name 9 Users 10 Work sheet Orders 11 Product without margin 12 Major Audit 13 Orders 14 Total Sales 15 Total Revenue 16 Profit by 17 18 19 20										Average 157.4 Count 8132 Sum 767									
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Adekoyejo Sobola (1601748)
DATA ANALYTICS

Appendix 5

File

Home

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Page Layout

Formulas

Data

Review

View

Help

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General

Conditional Formatting

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AD8098

=IFERROR(LOOKUP(B8098,Returned_Order_id,2,FALSE),"")

R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
Product Name	Product Cont	Product Base Margin	Ship Date	% of Sales	Ship-order	Profit or Loss	Review	Revenue	Order ID	Status	Regions Manag	Returned Item	Quality check	Quality Impact
8095 GBC DocuBind 200 Manual Binding Mx Small Box		0.35	22/03/2013	0.13%	1	profit		8239.49			Ali / peter			
8095 GBC DocuBind 200 Manual Binding Mx Small Box		0.35	02/10/2014	0.13%	4	profit		9758.51			Ali / peter			
8097 Canon PCH40 Copier		0.38	06/08/2015	0.15%	2	profit		12540.77			Willary/Peter			
8098 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	01/05/2015	0.17%	1	profit		14158.92			Samy/Peter			
8099 Polycorn Soundstation EX-Audio-Cont'd Medium Box		0.36	16/08/2014	0.14%	4	profit		11091.71			Ali / peter			
8100 GBC DocuBind TL300 Electric Binding Small Box		0.38	10/01/2013	0.15%	2	profit		12435.67			Willary/Peter	Returned	Quality Check	Major Local Control Audit
8101 Follows PB300 Plastic Comb Binding Small Box		0.38	17/08/2013	0.14%	1	profit		18781.53			Samy/Peter			
8102 Canon PCH400 Personal Copier Large Box		0.5	22/10/2013	0.19%	2	profit		16603.63			Samy/Peter			
8103 GBC DocuBind TL300 Electric Binding Small Box		0.38	02/10/2013	0.16%	2	profit		13553.00			Ali / peter			
8104 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	01/10/2014	0.17%	2	profit		14235.86			Ali / peter			
8105 Hewlett Packard cp1700 [D_PS] Serie Jumbo Drum		0.38	21/11/2016	0.16%	2	profit		11371.61			Samy/Peter	Returned	Quality Check	Major Local Control Audit
8106 Follows PB500 Electric Punch Plastic Small Box		0.35	09/06/2013	0.17%	2	profit		13261.63			Willary/Peter	Returned	Quality Check	Major Local Control Audit
8107 Follows PB500 Electric Punch Plastic Small Box		0.35	06/10/2013	0.16%	2	profit		13854.36			Ali / peter			
8108 Hewlett Packard Business Color Inkjet Jumbo Drum		0.4	08/07/2015	0.21%	9	profit		17569.11			Willary/Peter			
8109 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	09/01/2014	0.20%	1	profit		16165.70			Ali / peter			
8110 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	04/07/2015	0.20%	1	profit		15712.10			Willary/Peter			
8111 Hewlett Packard Business Color Inkjet Jumbo Drum		0.4	07/06/2013	0.19%	7	profit		13433.02			Willary/Peter			
8112 Canon Image Class D660 Copier Large Box		0.44	13/01/2014	0.21%	4	profit		17111.25			Willary/Peter			
8113 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	15/03/2015	0.20%	0	profit		15239.77			Willary/Peter			
8114 Polycorn ViaVideo Desktop Video CC Large Box		0.37	10/01/2013	0.20%	7	profit		13084.52			Willary/Peter			
8115 Polycorn ViewStation VSDM Videocam Large Box		0.39	22/03/2013	0.63%	1	profit		61815.87			Samy/Peter			
8116				100.00%				12571485.27						
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Quality Control

Product Line Impact

Count Return

816

0.00% Low Impact

0.04% Low Local Control Audit

0.05% Medium Impact

0.05% Medium Local Control Audit

0.12% Major Local Control Audit

Count if Quality Impact

Major Local Control Audit

Medium Local Control Audit

Medium Impact

Low Local Control Audit

Low Impact

13

19

24

24

24

1 Dashboard

2 Orders

3 Price Review Products

4 WEKA1

5 Counts

6 Total Sales

7 Average Sales

8 Total Revenue

9 Yearly Sales

10 Sales by Region

11 Profit by Region

12 Profit by Province ...

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09/07/2017

Appendix 6

Ade Sub SEUS105 DHB Superstore Sales 071217.0300 - Compatibility Mode - Excel																
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AD8117 =IFERROR(LOOKUP(B8117,Returned_Order_id,2,FALSE),"")																
R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF		
Product Name	Product Cont	Product Base Margin	Ship Date	% of Sales	Ship-order	Profit or Loss	Review	Revenue	Order ID	Status	Regions Manag	Returned Item	Quality check	Quality Impact		
8095 GBC DocuBind 200 Manual Binding Mx Small Box		0.35	22/03/2013	0.13%	1	profit		8239.49			Ali / peter					
8095 GBC DocuBind 200 Manual Binding Mx Small Box		0.35	02/10/2014	0.13%	4	profit		9758.51			Ali / peter					
8097 Canon PCH40 Copier		0.38	06/08/2015	0.15%	2	profit		12540.77			Willary/Peter					
8098 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	01/05/2015	0.17%	1	profit		14158.92			Samy/Peter					
8099 Polycorn Soundstation EX-Audio-Cont'd Medium Box		0.36	16/08/2014	0.14%	4	profit		11091.71			Ali / peter					
8100 GBC DocuBind TL300 Electric Binding Small Box		0.38	10/01/2013	0.15%	2	profit		15435.67			Willary/Peter	Returned	Quality Check	Major Local Control Audit		
8101 Follows PB300 Plastic Comb Binding Small Box		0.38	17/08/2013	0.14%	1	profit		18781.53			Samy/Peter					
8102 Canon PCH400 Personnel Copier Large Box		0.5	22/10/2013	0.15%	2	profit		16603.63			Samy/Peter					
8103 GBC DocuBind TL300 Electric Binding Small Box		0.38	02/10/2013	0.16%	2	profit		13553.00			Ali / peter					
8104 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	01/10/2014	0.17%	2	profit		14235.86			Ali / peter					
8105 Hewlett Packard cp1700 [D_PS] Serie Jumbo Drum		0.38	21/11/2016	0.16%	2	profit		11371.61			Samy/Peter	Returned	Quality Check	Major Local Control Audit		
8106 Follows PB500 Electric Punch Plastic Small Box		0.35	09/06/2013	0.17%	2	profit		13261.63			Willary/Peter	Returned	Quality Check	Major Local Control Audit		
8107 Follows PB500 Electric Punch Plastic Small Box		0.35	06/10/2013	0.16%	2	profit		13854.36			Ali / peter					
8108 Hewlett Packard Business Color Inkjet Jumbo Drum		0.4	08/07/2015	0.21%	9	profit		17569.11			Willary/Peter					
8109 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	09/01/2014	0.20%	1	profit		16165.70			Ali / peter					
8110 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	04/07/2015	0.20%	1	profit		15712.10			Willary/Peter					
8111 Hewlett Packard Business Color Inkjet Jumbo Drum		0.4	07/06/2013	0.19%	7	profit		13433.02			Willary/Peter					
8112 Canon Image Class D660 Copier Large Box		0.44	13/01/2014	0.21%	4	profit		17111.25			Willary/Peter					
8113 Hewlett Packard LaserJet 3310 Copier Large Box		0.37	15/03/2015	0.20%	0	profit		15239.77			Willary/Peter					
8114 Polycorn ViaVideo Desktop Video CC Large Box		0.37	10/01/2013	0.20%	7	profit		13084.52			Willary/Peter					
8115 Polycorn ViaVideo Desktop Video CC Large Box		0.39	22/03/2013	0.63%	1	profit		61815.87			Samy/Peter					
8116				100.00%				12571485.27								
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Adekoyejo Sobola (1601748)
DATA ANALYTICS

Appendix 7

Excel screenshot showing a data table with columns: Product Name, Product Base Margin, Ship Date, % of Sales, Ship-order, Profit or Loss, Review, Revenue, Order ID, Status, Regions Manager, Returned Item, Quality Check, Quality Impact. The table lists various products like GBC DocuBind 200 Manual Binding, Canon PCH40 Copier, Hewlett Packard LaserJet 3310 Copier, etc. The bottom section shows a summary table with rows for Quality Control, Product Line Impact, and Count if Quality impact.

Product Name	Product Base Margin	Ship Date	% of Sales	Ship-order	Profit or Loss	Review	Revenue	Order ID	Status	Regions Manager	Returned Item	Quality Check	Quality Impact
8095 GBC DocuBind 200 Manual Binding M Small Box	0.35	22/03/2013	0.13%	1	profit		9239.49			Ali / peter			
8096 GBC DocuBind 200 Manual Binding M Small Box	0.35	02/10/2014	0.13%	4	profit		9759.51			Ali / peter			
8097 Canon PCH40 Copier	0.38	06/09/2015	0.15%	2	profit		12540.77			Willary Peter			
8098 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	01/05/2015	0.17%	1	profit		14158.92			Sany Peter			
8099 Polycam Soundstation EX Audio-Cont Medium Box	0.36	16/09/2014	0.14%	4	profit		11091.71			Ali / peter			
8100 GBC DocuBind TL300 Electric Binding Small Box	0.38	10/01/2013	0.15%	2	profit		12435.67			Willary Peter	Returned	Quality Check	Major Local Control Audit
8101 Fellowes PB300 Plastic Comb Binding Small Box	0.38	17/09/2013	0.14%	1	profit		10781.53			Sany Peter			
8102 Canon PCH100F Personal Copier Large Box	0.55	22/10/2013	0.19%	2	profit		16603.63			Sany Peter			
8103 GBC DocuBind TL300 Electric Binding Small Box	0.38	02/10/2013	0.16%	2	profit		13559.00			Ali / peter			
8104 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	01/10/2014	0.17%	2	profit		14235.96			Ali / peter			
8105 Hewlett Packard cp1700 [D PS] Series Jumbo Drum	0.38	21/11/2016	0.16%	2	profit		11371.61			Sany Peter	Returned	Quality Check	Major Local Control Audit
8106 Fellowes PB500 Electric Punch Plastic Small Box	0.35	09/06/2013	0.17%	2	profit		12821.63			Willary Peter	Returned	Quality Check	Major Local Control Audit
8107 Fellowes PB500 Electric Punch Plastic Small Box	0.35	06/10/2013	0.18%	2	profit		13854.36			Ali / peter			
8108 Hewlett Packard Business Color Inkjet Jumbo Drum	0.4	08/07/2015	0.21%	2	profit		17569.11			Willary Peter			
8109 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	08/01/2014	0.20%	9	profit		16165.70			Ali / peter			
8110 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	04/07/2015	0.20%	1	profit		15712.10			Willary Peter			
8111 Hewlett Packard Business Color Inkjet Jumbo Drum	0.4	07/08/2013	0.19%	7	profit		13433.02			Willary Peter			
8112 Canon Image Class D600 Copier Large Box	0.44	13/01/2014	0.21%	4	profit		17111.25			Willary Peter			
8113 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	15/03/2015	0.20%	0	profit		15299.77			Willary Peter			
8114 Polycam ViewVideo Desktop Video Dc Large Box	0.37	10/01/2013	0.20%	7	profit		13894.52			Willary Peter			
8115 Polycam ViewStation ISON Videocom Large Box	0.39	22/03/2013	0.63%	1	profit		61815.67			Sany Peter			
8116			100.00%				12571485.27						
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Summary Table:

Quality Control	Product Line Impact	Count if returned Critical
0.00% Low Impact		816
0.04% Low Local Control Audit		161
0.05% Medium Impact		
0.08% Medium Local Control Audit		
0.12% Major Local Control Audit		
Count if Quality impact		
Major Local Control Audit		12
Medium Local Control Audit		19
Medium Impact		24
Low Local Control Audit		12
Low Impact		749

Appendix 8

Excel screenshot showing a data table with columns: Product Name, Product Base Margin, Ship Date, % of Sales, Ship-order, Profit or Loss, Review, Revenue, Order ID, Status, Regions Manager, Returned Item, Quality Check, Quality Impact. The table lists various products like GBC DocuBind 200 Manual Binding, Canon PCH40 Copier, Hewlett Packard LaserJet 3310 Copier, etc. The bottom section shows a summary table with rows for Quality Control, Product Line Impact, and Count if Quality impact.

Product Name	Product Base Margin	Ship Date	% of Sales	Ship-order	Profit or Loss	Review	Revenue	Order ID	Status	Regions Manager	Returned Item	Quality Check	Quality Impact
8095 GBC DocuBind 200 Manual Binding M Small Box	0.35	22/03/2013	0.13%	1	profit		9239.49			Ali / peter			
8096 GBC DocuBind 200 Manual Binding M Small Box	0.35	02/10/2014	0.13%	4	profit		9759.51			Ali / peter			
8097 Canon PCH40 Copier	0.38	06/09/2015	0.15%	2	profit		12540.77			Willary Peter			
8098 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	01/05/2015	0.17%	1	profit		14158.92			Sany Peter			
8099 Polycam Soundstation EX Audio-Cont Medium Box	0.36	16/09/2014	0.14%	4	profit		11091.71			Ali / peter			
8100 GBC DocuBind TL300 Electric Binding Small Box	0.38	10/01/2013	0.15%	2	profit		12435.67			Willary Peter	Returned	Quality Check	Major Local Control Audit
8101 Fellowes PB300 Plastic Comb Binding Small Box	0.38	17/09/2013	0.14%	1	profit		10781.53			Sany Peter			
8102 Canon PCH100F Personal Copier Large Box	0.55	22/10/2013	0.19%	2	profit		16603.63			Sany Peter			
8103 GBC DocuBind TL300 Electric Binding Small Box	0.38	02/10/2013	0.16%	2	profit		13559.00			Ali / peter			
8104 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	01/10/2014	0.17%	2	profit		14235.96			Ali / peter			
8105 Hewlett Packard cp1700 [D PS] Series Jumbo Drum	0.38	21/11/2016	0.16%	2	profit		11371.61			Sany Peter	Returned	Quality Check	Major Local Control Audit
8106 Fellowes PB500 Electric Punch Plastic Small Box	0.35	09/06/2013	0.17%	2	profit		12821.63			Willary Peter	Returned	Quality Check	Major Local Control Audit
8107 Fellowes PB500 Electric Punch Plastic Small Box	0.35	06/10/2013	0.18%	2	profit		13854.36			Ali / peter			
8108 Hewlett Packard Business Color Inkjet Jumbo Drum	0.4	08/07/2015	0.21%	2	profit		17569.11			Willary Peter			
8109 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	08/01/2014	0.20%	9	profit		16165.70			Ali / peter			
8110 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	04/07/2015	0.20%	1	profit		15712.10			Willary Peter			
8111 Hewlett Packard Business Color Inkjet Jumbo Drum	0.4	07/08/2013	0.19%	7	profit		13433.02			Willary Peter			
8112 Canon Image Class D600 Copier Large Box	0.44	13/01/2014	0.21%	4	profit		17111.25			Willary Peter			
8113 Hewlett Packard LaserJet 3310 Copier Large Box	0.37	15/03/2015	0.20%	0	profit		15299.77			Willary Peter			
8114 Polycam ViewVideo Desktop Video Dc Large Box	0.37	10/01/2013	0.20%	7	profit		13894.52			Willary Peter			
8115 Polycam ViewStation ISON Videocom Large Box	0.39	22/03/2013	0.63%	1	profit		61815.67			Sany Peter			
8116			100.00%				12571485.27						
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8132													
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8134													
8135													

Summary Table:

Quality Control	Product Line Impact	Count if returned Critical
0.00% Low Impact		816
0.04% Low Local Control Audit		161
0.05% Medium Impact		
0.08% Medium Local Control Audit		
0.12% Major Local Control Audit		
Count if Quality impact		
Major Local Control Audit		12
Medium Local Control Audit		19
Medium Impact		24
Low Local Control Audit		12
Low Impact		749

Adekoyejo Sobola (1601748)
DATA ANALYTICS

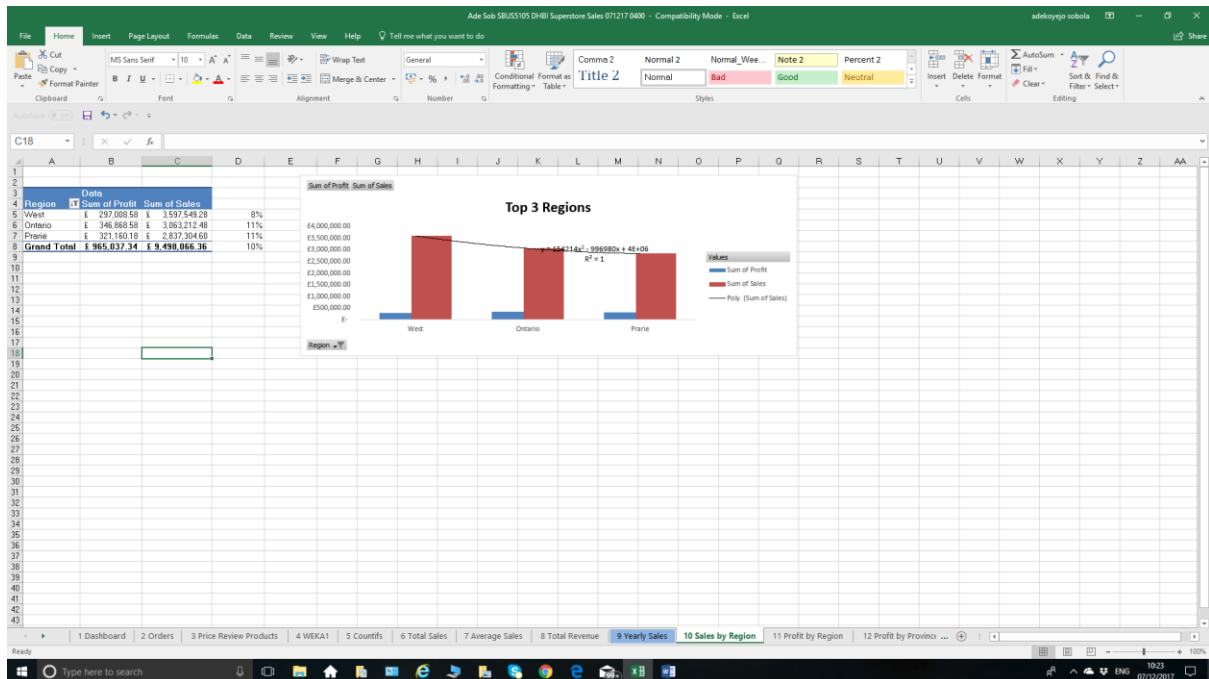
Appendix 11

Ship Date	% of Sales	Ship-order	Profit or Loss	Review	Revenue	Order ID	Status	Regions Manag	Returned Item	Quality Check	Quality Impact	critical & F	New sales Invoic	Invoicing Discrepancy
26/01/2013	0.20%	4	profit		26621.65			Sany/Peter					28191.36	-11.29
01/02/2013	0.11%	3	profit		8522.67			Sany/Peter	Returned	Quality Check	Medium Local Control Audit		15997.24	150.37
22/02/2013	0.15%	1	profit		13711.28			Ali/peter					29540.31	786.96
27/01/2014	0.11%	1	profit		7485.20			Willen/Peter					17033.32	-1880.77
07/03/2016	0.14%	2	profit		11680.79			Willen/Peter					19349.57	112.23
21/04/2013	0.13%	2	profit		18154.91			Ali/peter					18935.29	-462.52
22/01/2016	0.18%	2	profit		16652.18			Ali/peter					24047.04	654.09
14/12/2016	0.01%	2	profit		579.52			Ali/peter					1786.14	51.8
24/01/2015	0.13%	5	profit		8642.23			Sany/Peter					18035.29	-7.21
07/12/2013	0.15%	2	profit		13443.01			Sany/Peter					22399.68	-682.32
09/12/2014	0.13%	1	profit		9356.96			Ali/peter					18535.89	-818.55
23/03/2015	0.15%	3	profit		13139.57			Willen/Peter					22042.68	-510.45
11/11/2016	0.14%	2	profit		10979.99			Willen/Peter					19064.85	352.7
14/10/2014	0.13%	2	profit		10223.03			Willen/Peter					18043.65	732.11
22/10/2014	0.13%	2	profit		16685.17			Sany/Peter					20384.3	-3070.96
21/04/2014	0.18%	1	profit		15999.01			Willen/Peter					23045.08	1594.72
06/05/2013	0.11%	1	profit		6497.76			Willen/Peter					19538.22	-4277.44
13/01/2014	0.18%	2	profit		16506.56			Sany/Peter					24039.04	-472.96
28/11/2015	0.14%	1	profit		10511.67			Willen/Peter					19011.51	313.69
22/03/2013	0.13%	1	profit		9239.49			Ali/peter					17250.18	821.59
02/10/2014	0.13%	4	profit		9758.51			Ali/peter					18531.12	174.12
06/09/2015	0.15%	2	profit		12540.77			Willen/Peter					21149.53	-466.87
01/05/2015	0.17%	1	profit		14159.92			Sany/Peter					24589.59	-1318.54
14/04/2014	0.14%	4	profit		11091.71			Ali/peter					18999.81	1389.98
10/01/2013	0.15%	2	profit		12435.67			Willen/Peter	Returned	Quality Check	Major Local Control Audit		22424.75	-672.74
17/09/2013	0.14%	1	profit		10781.53			Sany/Peter					19399.5	775.98
22/10/2013	0.19%	2	profit		16603.83			Sany/Peter					25199.58	-927.34
02/10/2013	0.16%	2	profit		13559.00			Ali/peter					25115.72	-2089.26
01/10/2014	0.17%	2	profit		14235.96			Ali/peter					24599.59	-548.11
21/11/2015	0.16%	2	profit		11371.81			Sany/Peter	Returned	Quality Check	Major Local Control Audit		21542.14	-378.14
09/06/2013	0.17%	2	profit		12821.63			Willen/Peter	Returned	Quality Check	Major Local Control Audit		22877.82	915.11
06/10/2013	0.18%	2	profit		13854.36			Ali/peter					25418.8	-101.77
08/07/2015	0.21%	2	profit		17593.11			Willen/Peter					30722.62	-1536.13
08/01/2014	0.20%	9	profit		16165.70			Ali/peter					28799.52	-979.18
04/07/2015	0.20%	1	profit		15712.10			Willen/Peter					27599.54	121.44
07/08/2013	0.19%	2	profit		13433.02			Willen/Peter					26397.15	-2282.82
13/01/2014	0.21%	4	profit		17111.25			Willen/Peter					29399.51	-485.89
15/03/2015	0.20%	8	profit		15299.77			Willen/Peter					29999.5	-1334.99
10/01/2013	0.20%	7	profit		13884.52			Willen/Peter					28182.26	1817.4
22/03/2013	0.63%	1	profit		61815.87			Sany/Peter					88179.26	881.79

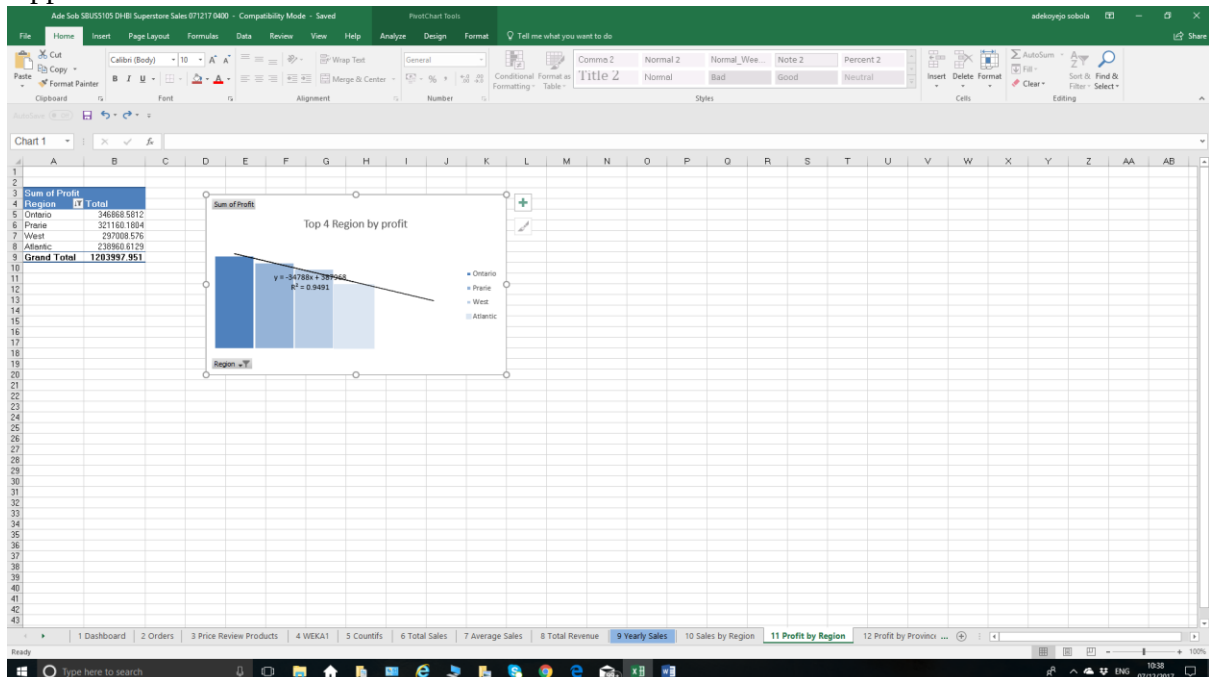
Appendix 12

Countif	High	Low	Medium	Not Specif	Countif Corporate & Critical	Price Review	Countif	Countif Quality Impact	Countif Major Impact	Countif Medium Impact	Countif Low Impact	Countif Accurate Invoice	Countif Return
Countif Critical	1553 A	Express Air	937										
Countif High	1787 A	Regular Air	6048										
Countif Low	1655 C	Delivery Truck	1129										
Countif Medium	1584 B		8114										
Countif Not Specif	1614												
Countif Corporate & Critical													
Countif Price Review													
Countif Quality Impact													
Countif Major Impact													
Countif Medium Impact													
Countif Low Impact													
Countif Accurate Invoice													
Countif Return													

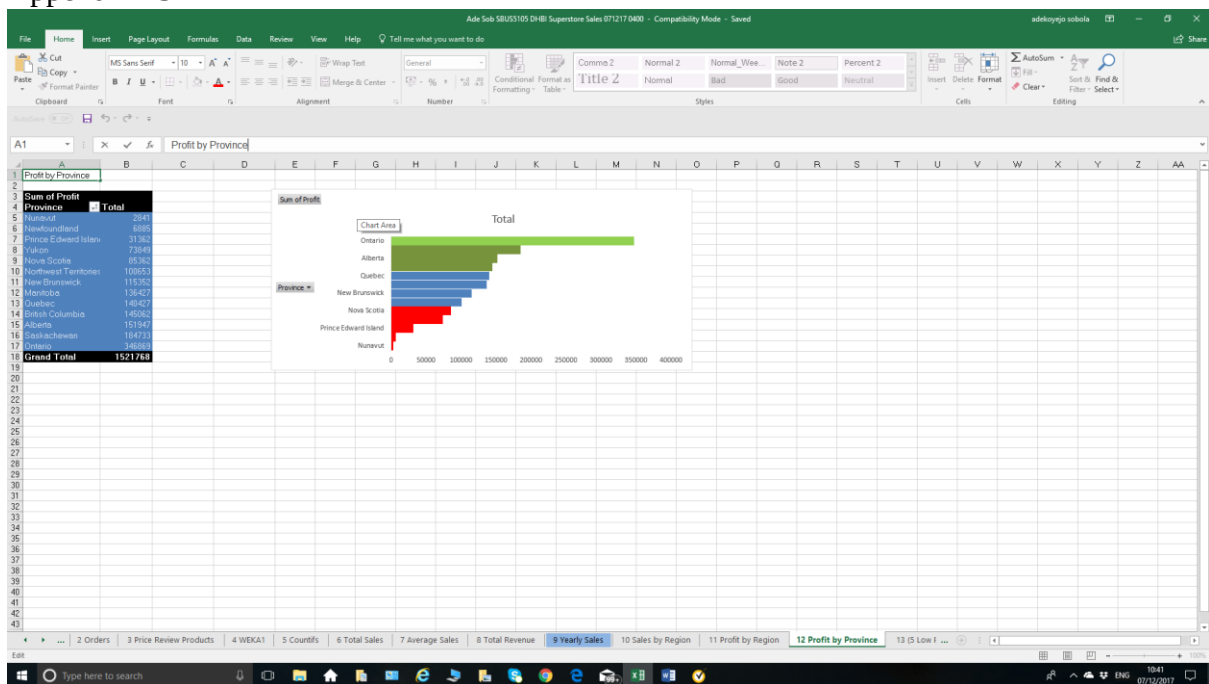
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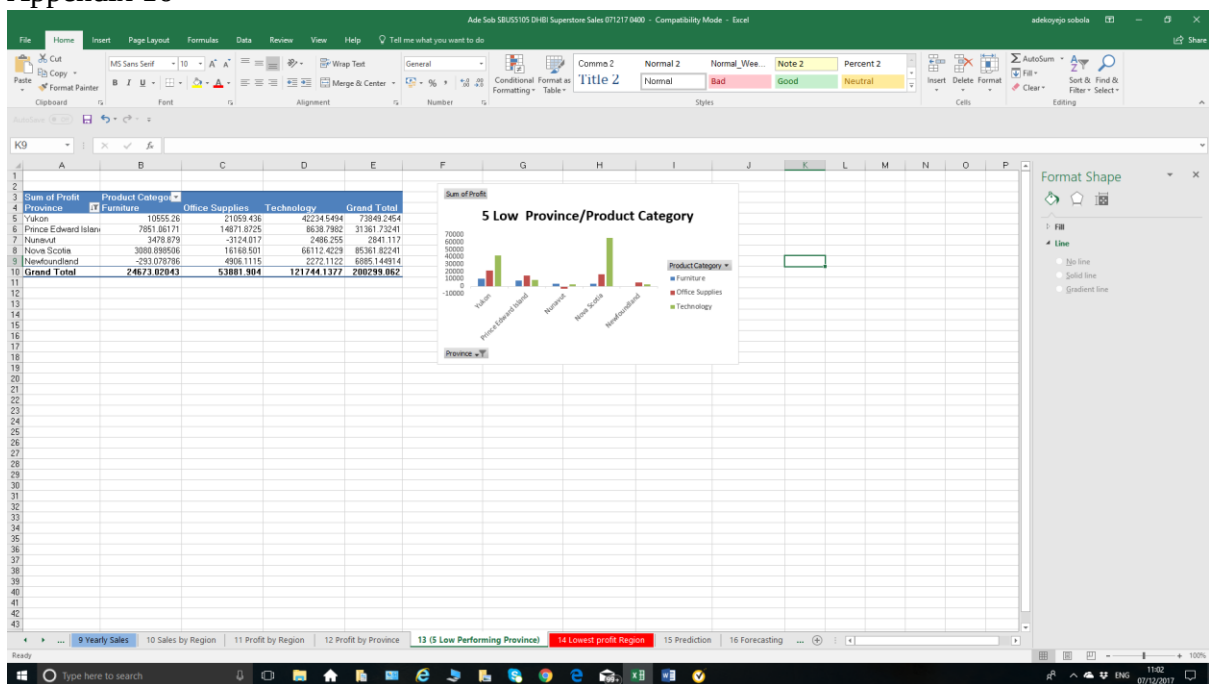
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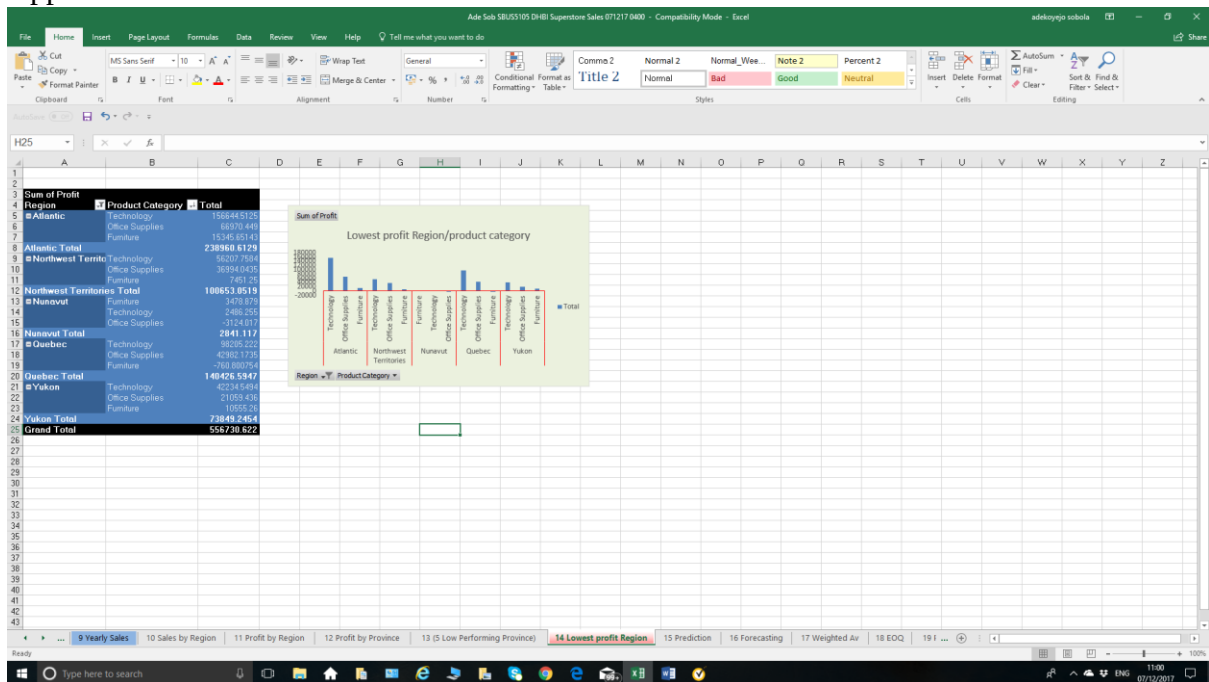
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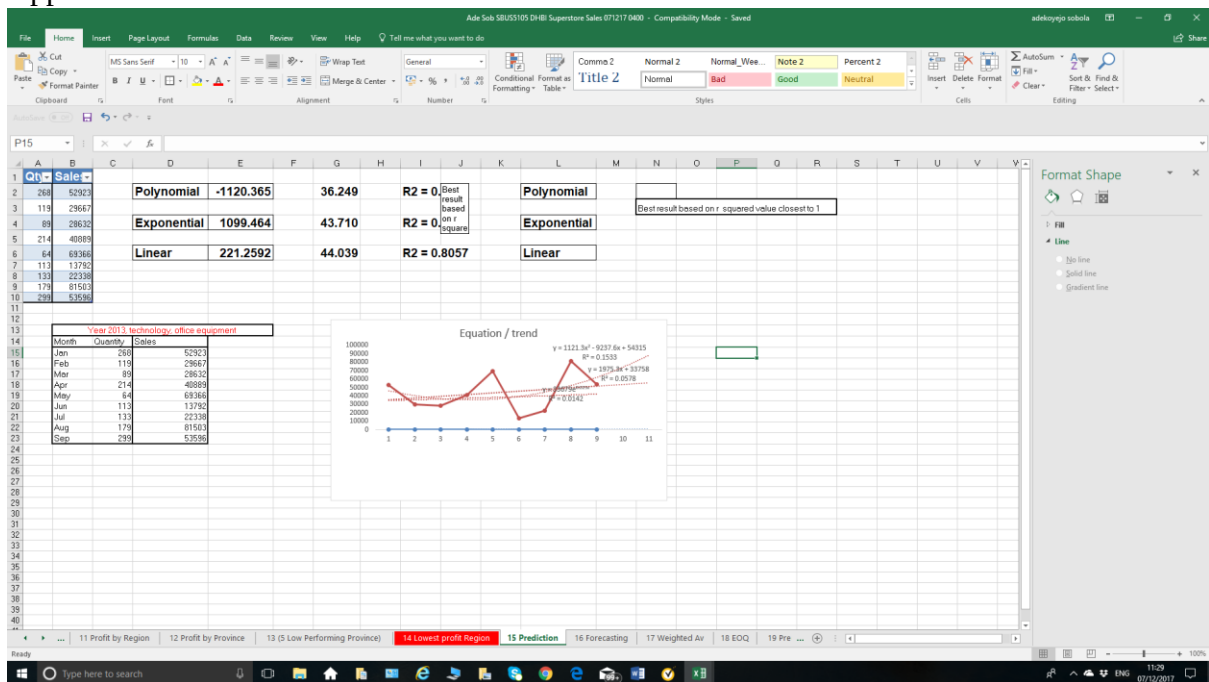
Appendix 16



Appendix 17

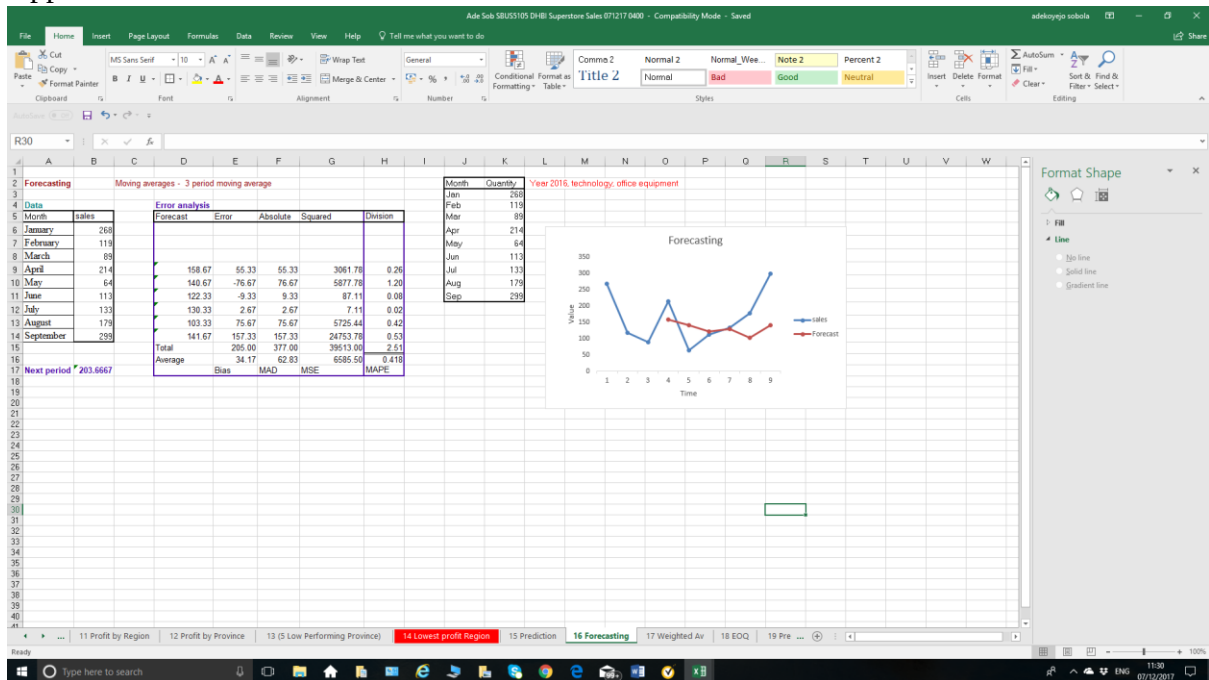


Appendix 18

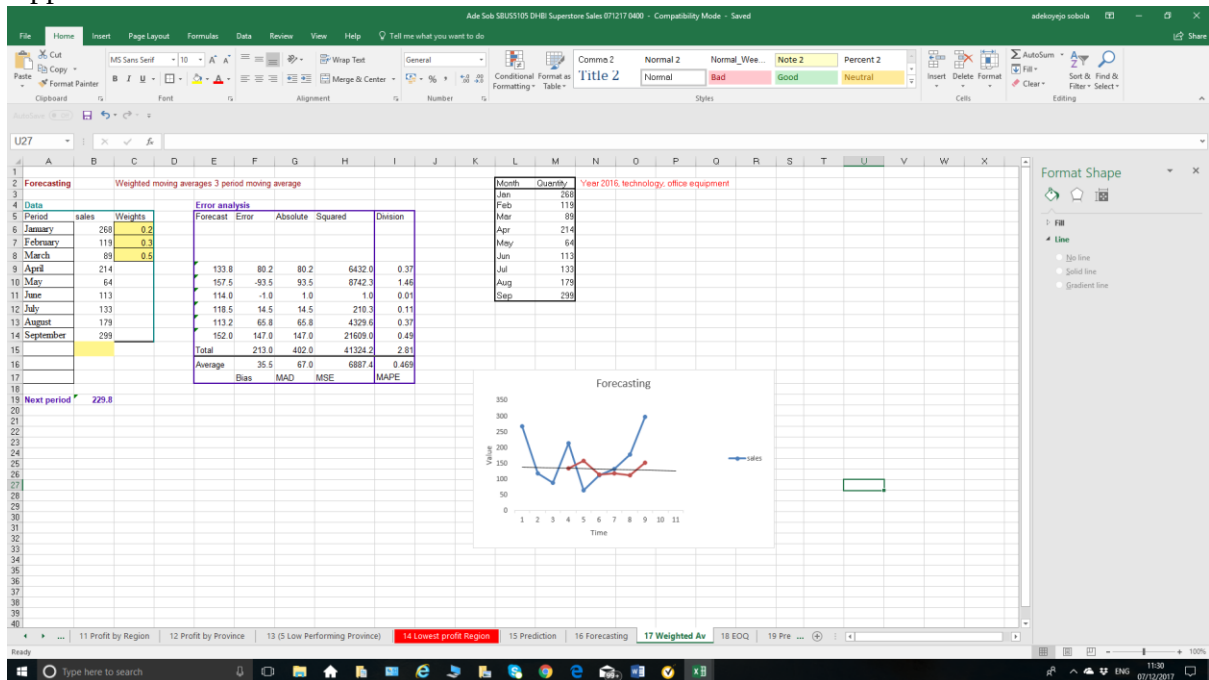


Adekoyejo Sobola (1601748)
DATA ANALYTICS

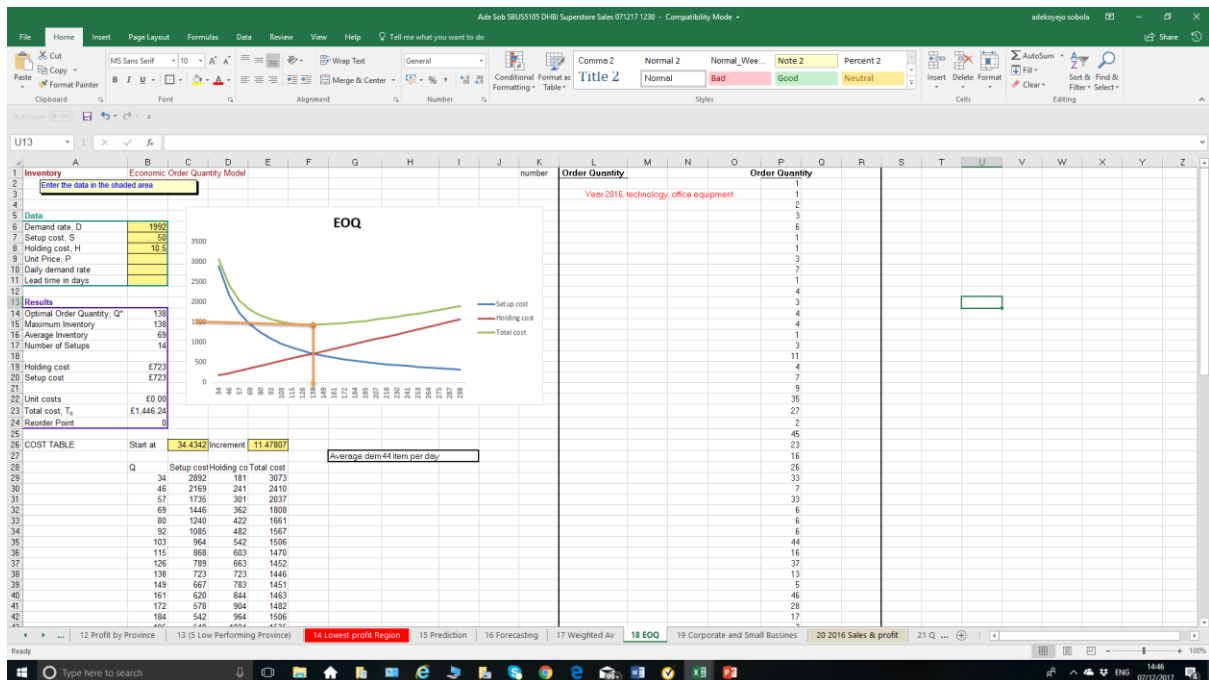
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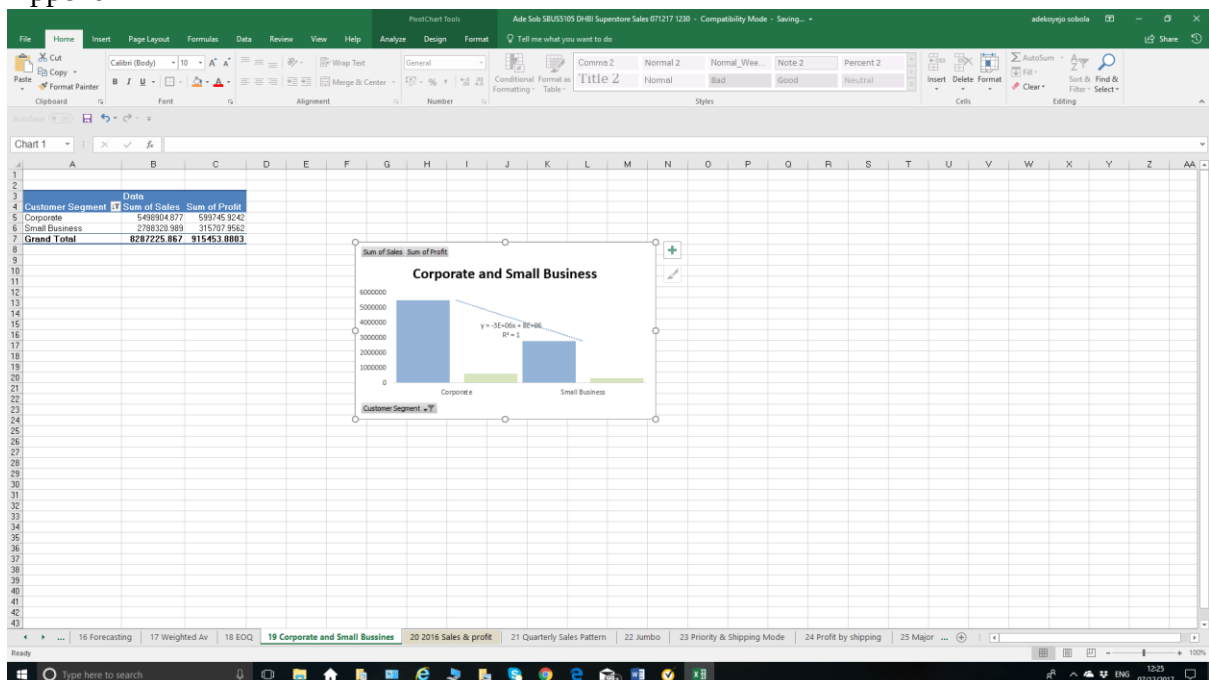
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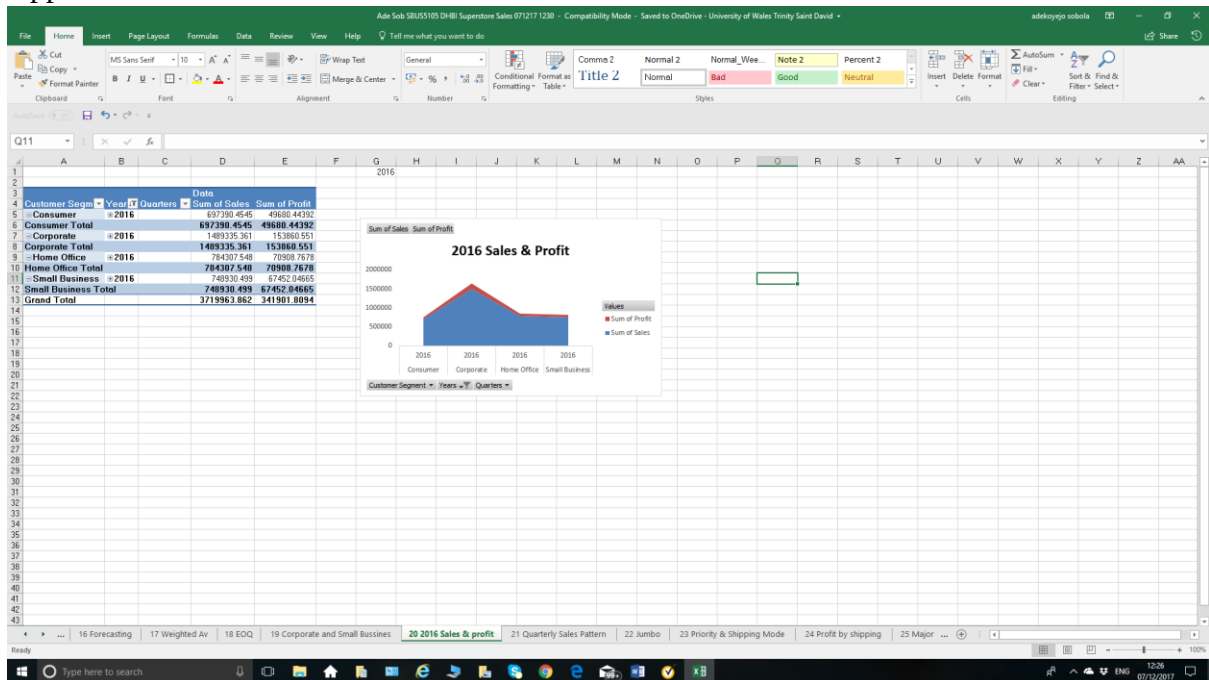
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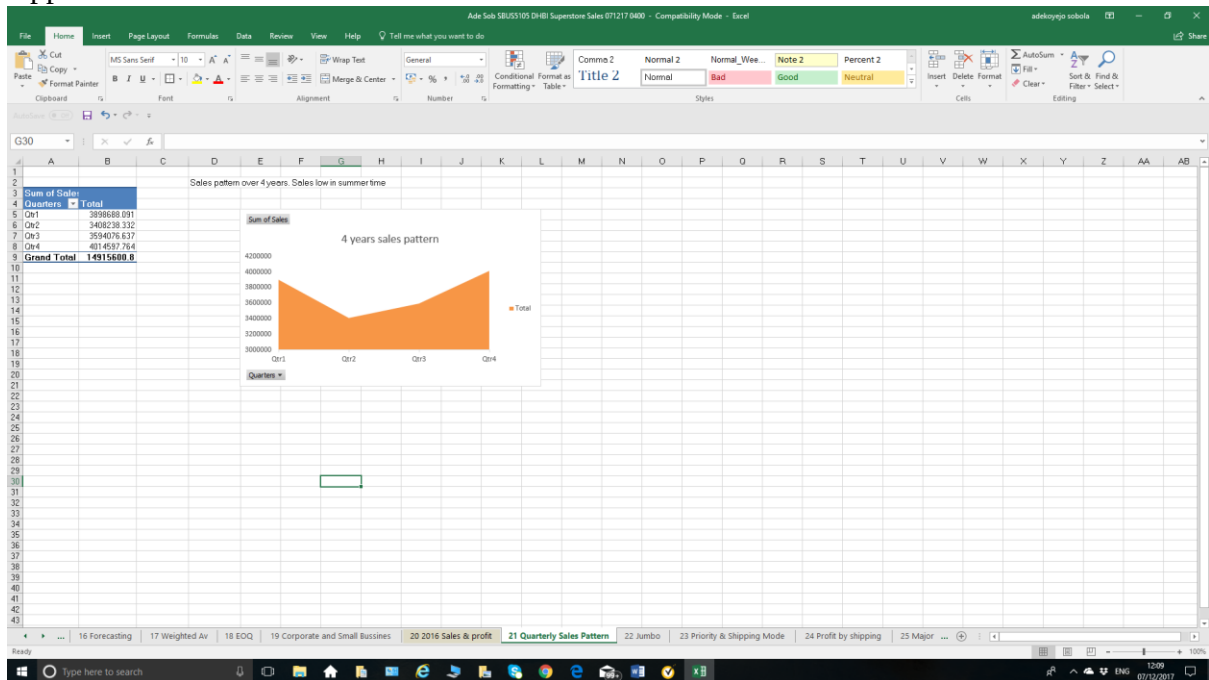
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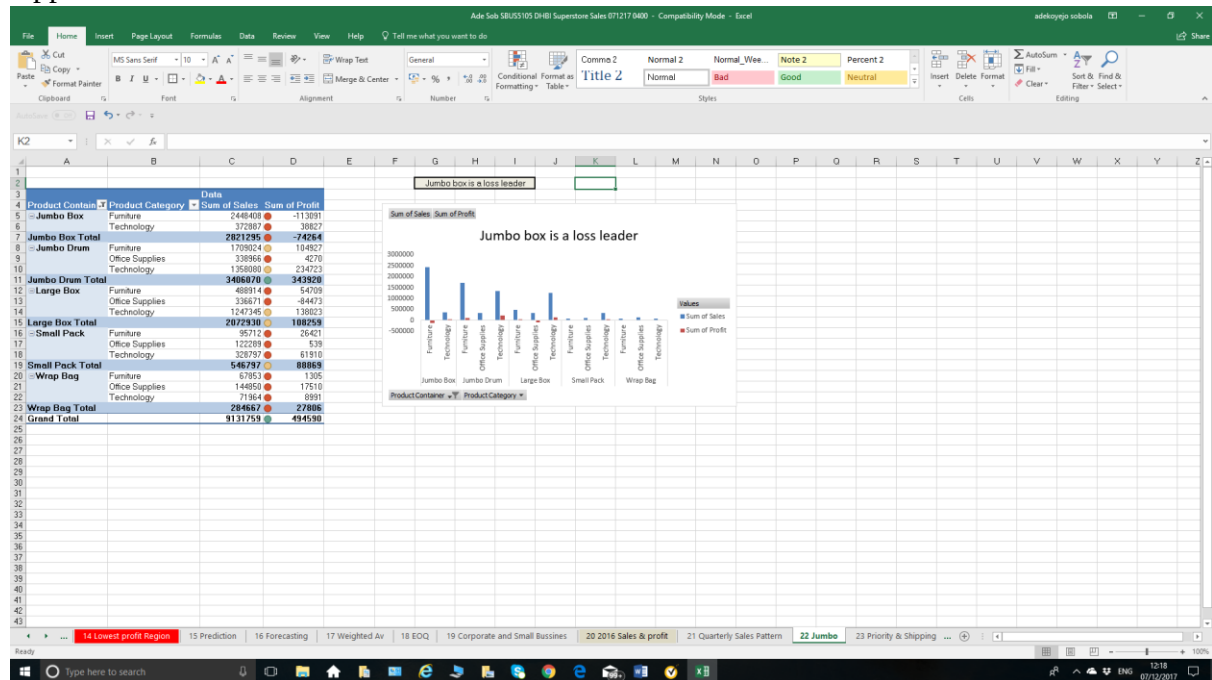
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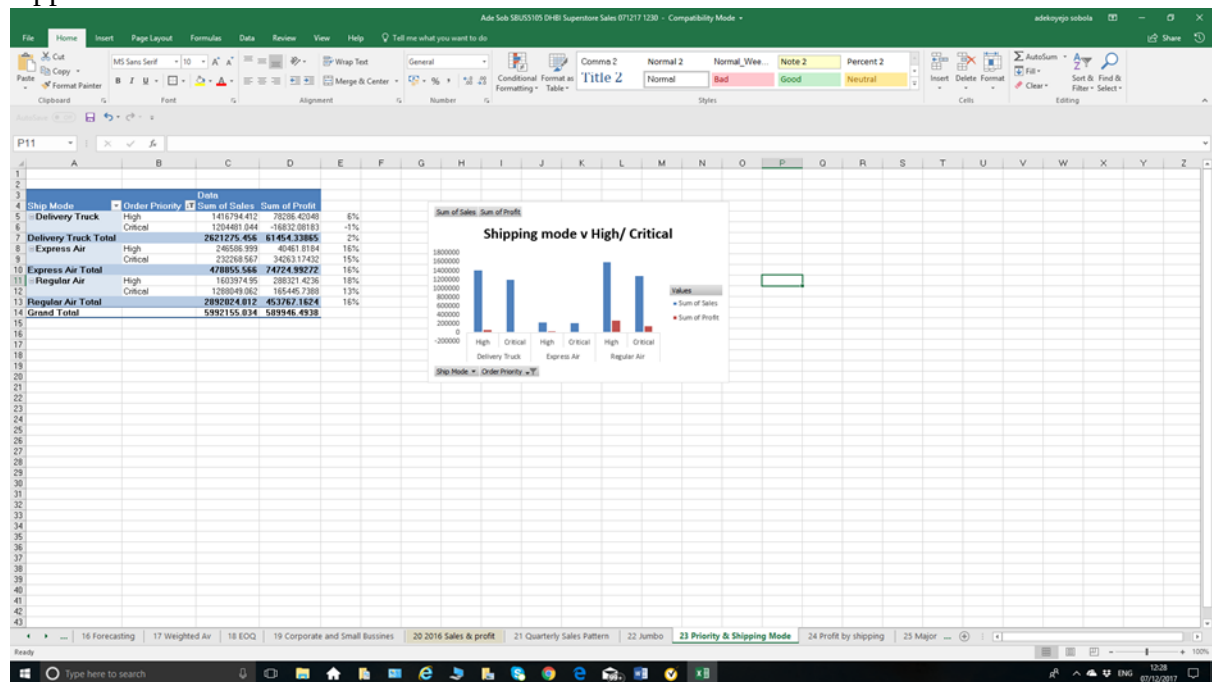
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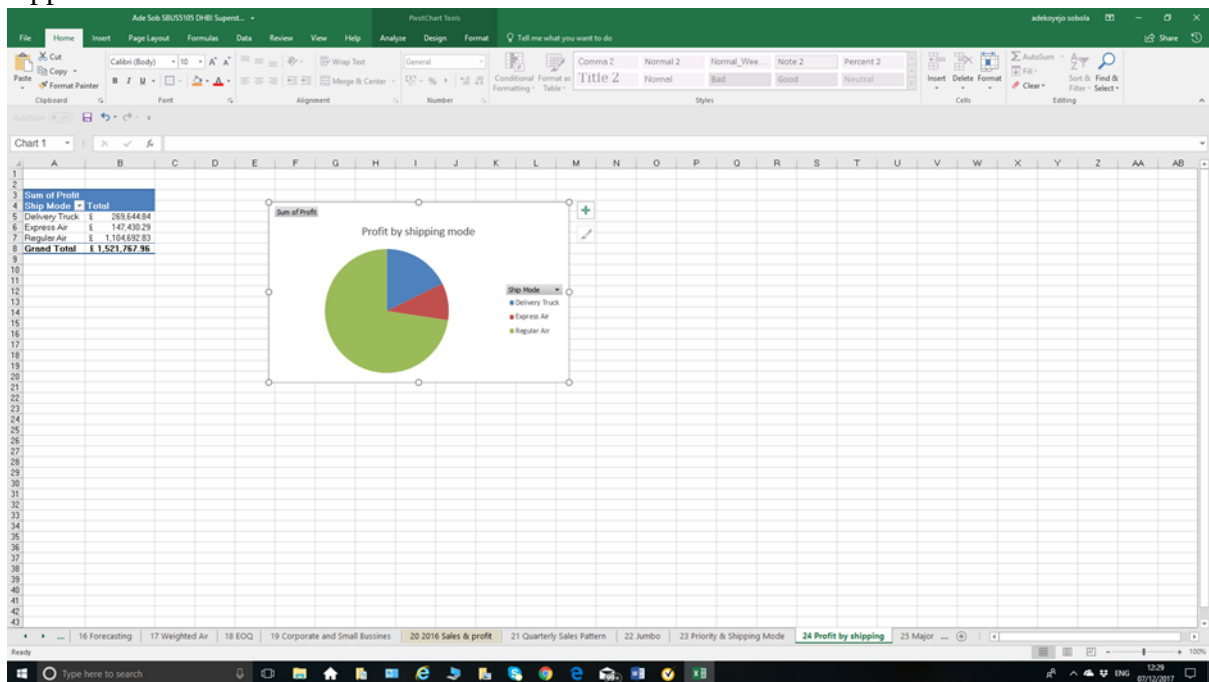
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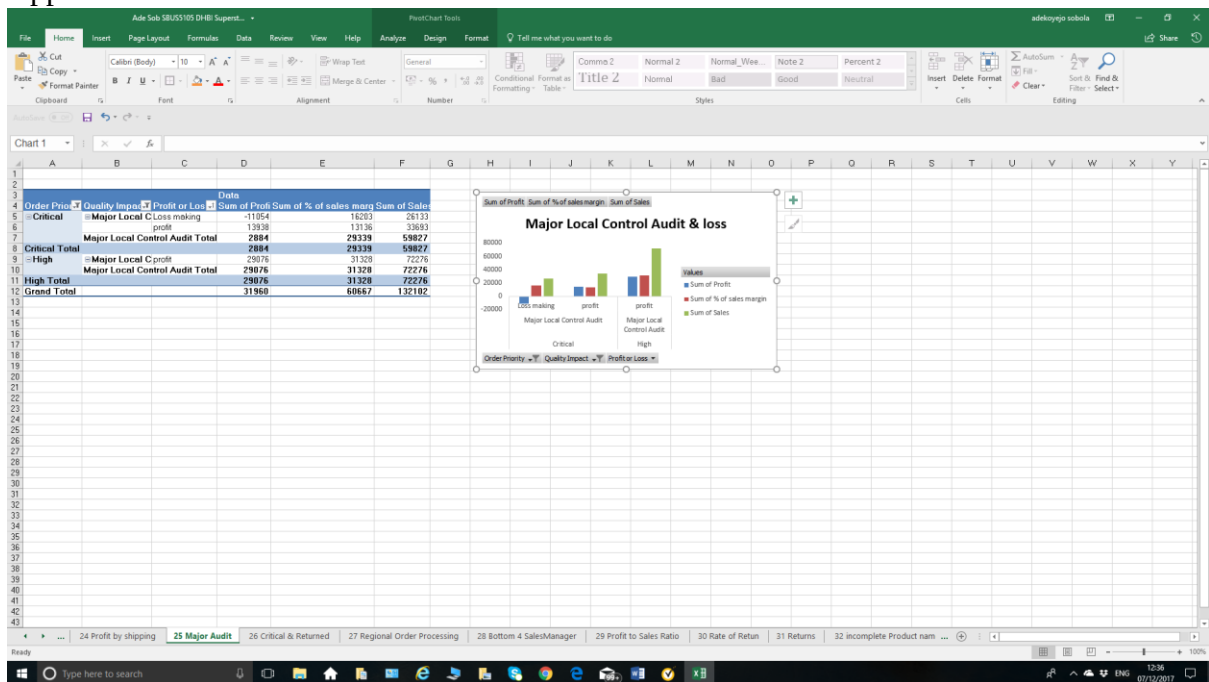
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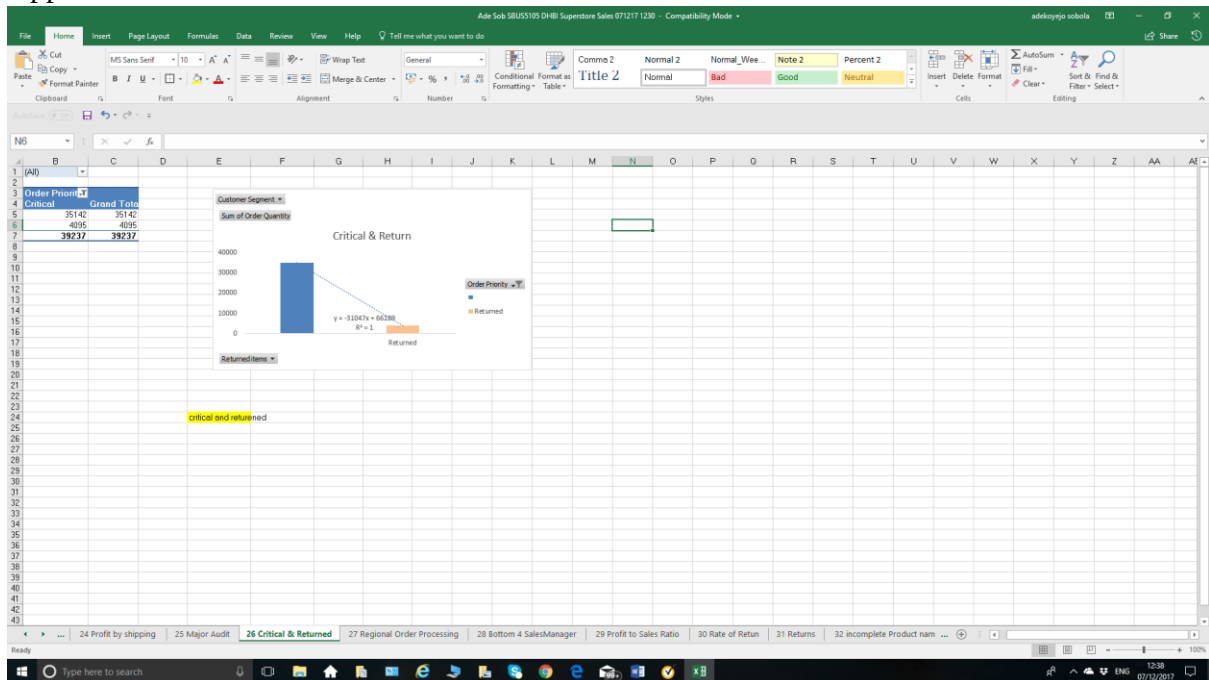
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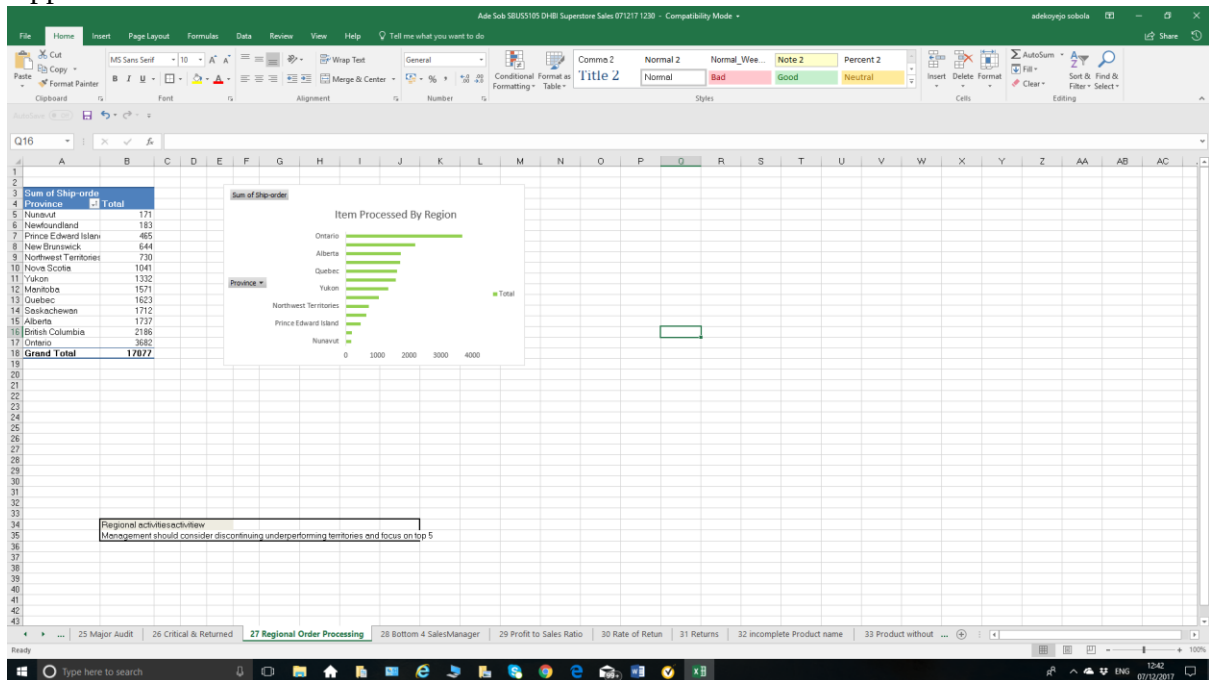
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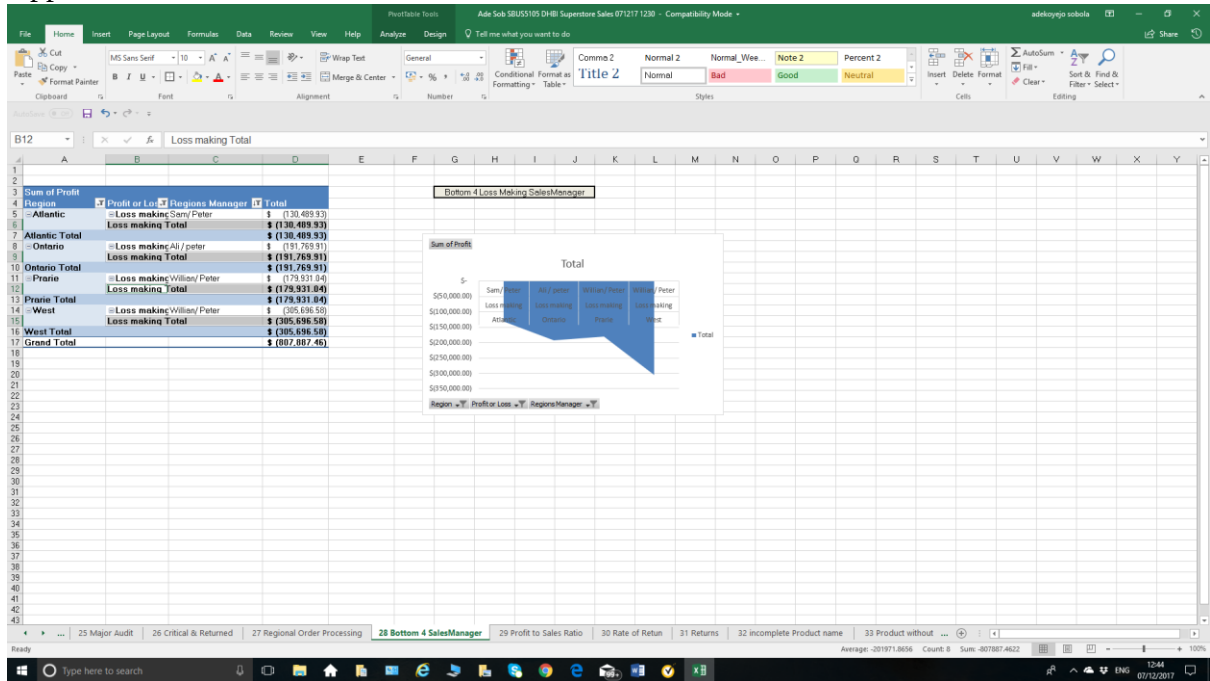
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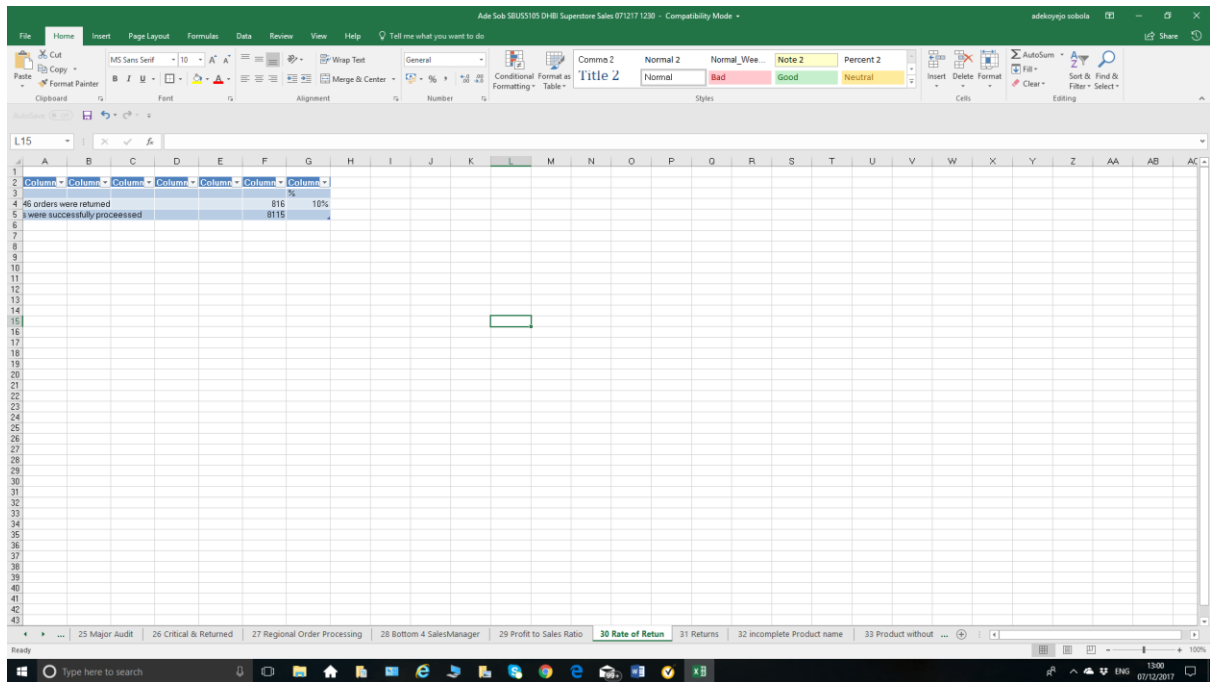
Appendix 30



Appendix 31



Appendix 32



Appendix 33

- Spreadsheet has some benefits such as it can
- It can summarise information from many sources in one place
- Present information in a format that help the decision-maker see the big picture
- It gives a specific view that is both precise and well structured.
- very easy to visualise complex data
- Very easy to perform mathematical computations different segments of the data

However, it cannot reproduce all types of graphs

Appendix 34

Main components of Spreadsheet

(Edwards & Finlay, 1997) Discoursed the three main components of Spreadsheet, they are

- Logic Model
- Data Model
- Presentation Model.

The Logic Models always have the Variable, Constant, Parameter, and Coefficient that is factor representing a relationship between two or more factors. In the construction of a Logic Model, there will be Conceptualization, Verbalization and Formalization.

Conceptualization is redefining issues, creating Model goals, determining the modelling techniques and determining the assumptions underlying techniques

Verbalization is about defining the modelling factors, writing the relationship between factors in English. The Formalization reveals the assigned Symbols to the model factors, Statement of units used, and Statement of any conventions used.

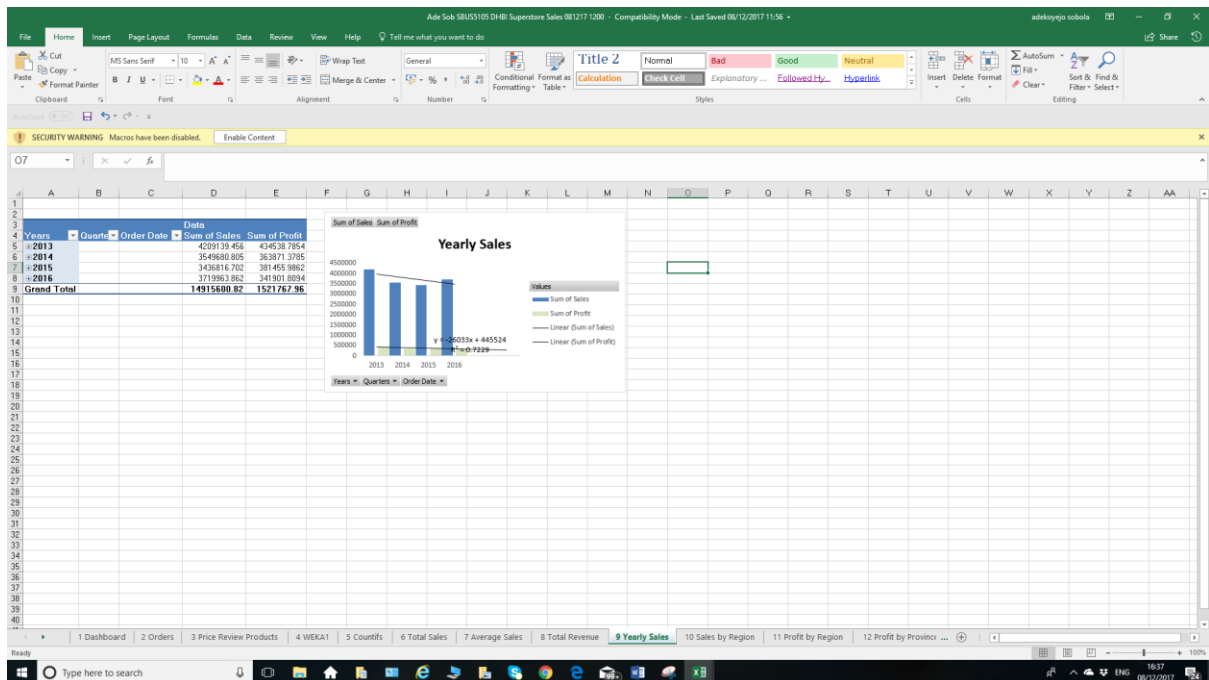
Furthermore, Data model is the process of documenting complex software system design into an easily understood diagram. The Presentation Model seeks to reveal the larger, more complex principal model and can highlight and communicate to Results in a visually appealing way.

More so, the decision support modelling is very helpful for decision makers, it can be useful in the supply chain management and the Inventory Model (EOQ Model), Linear programming and Forecasting Techniques a simulation modelling.

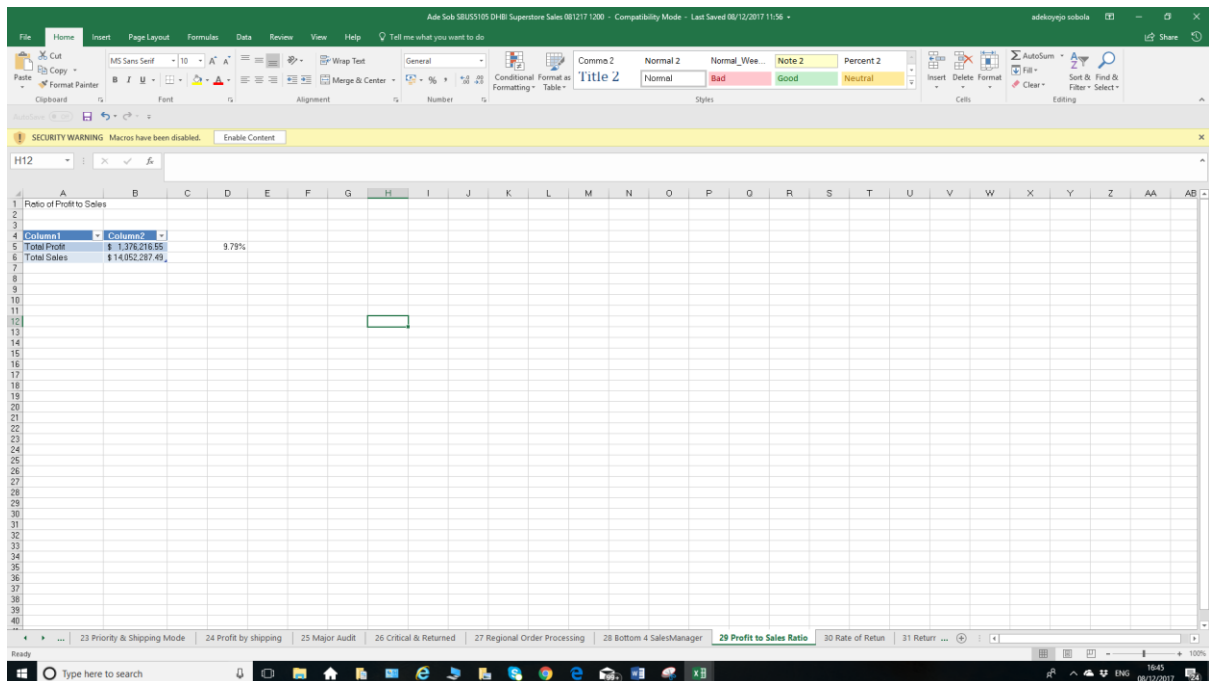
Presentation Model

The presentation Model seeks to highlight, reveal and communicate the result of the complex portions of the spreadsheet but the drawback is that with picture you some underlying data may not be revealed, because pictures can suppress data to provide information that is visually appealing.

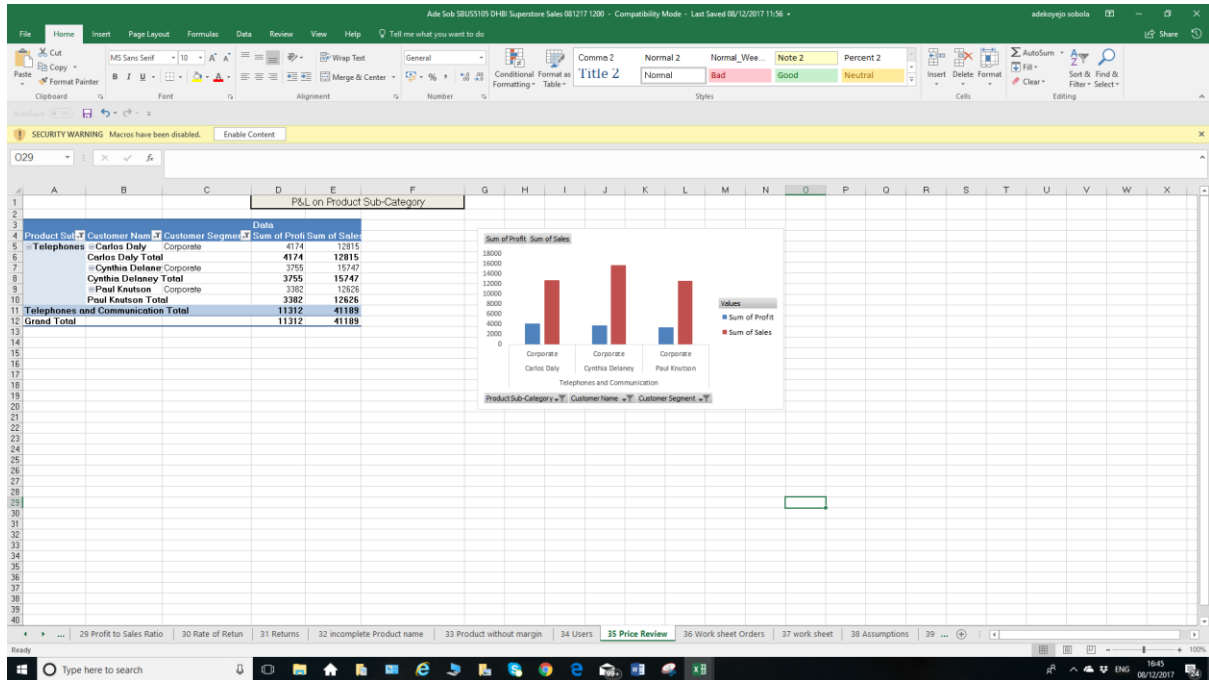
Appendix 35



Appendix 36

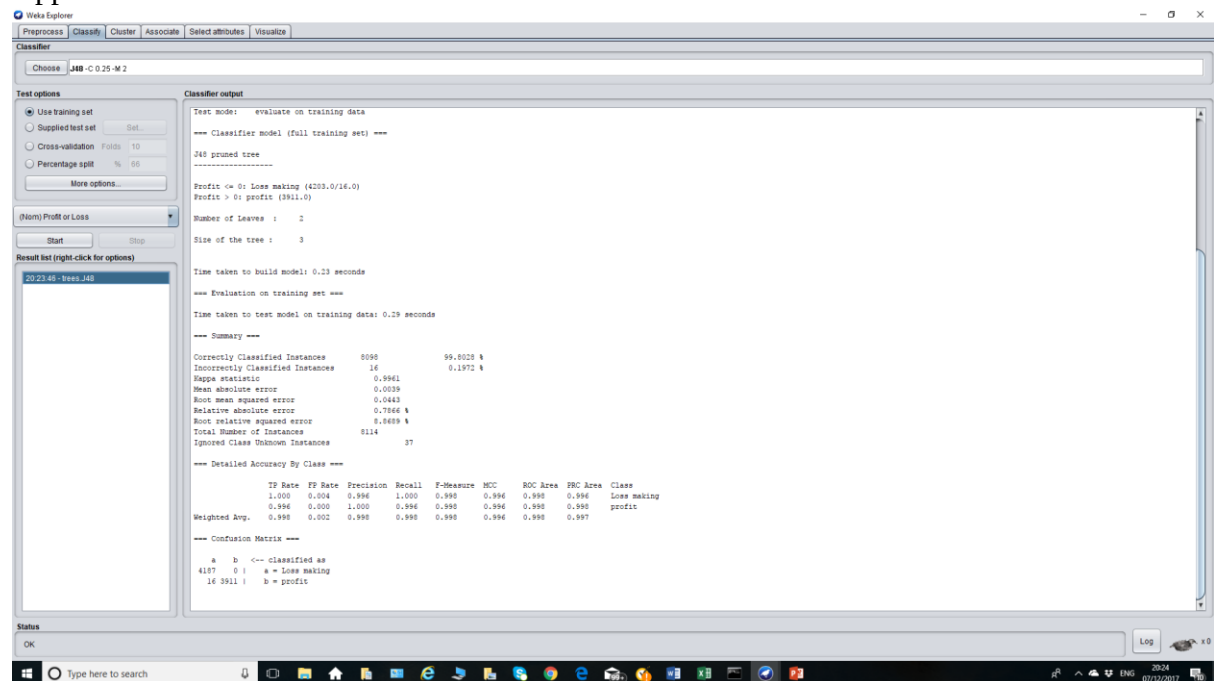


Appendix 37

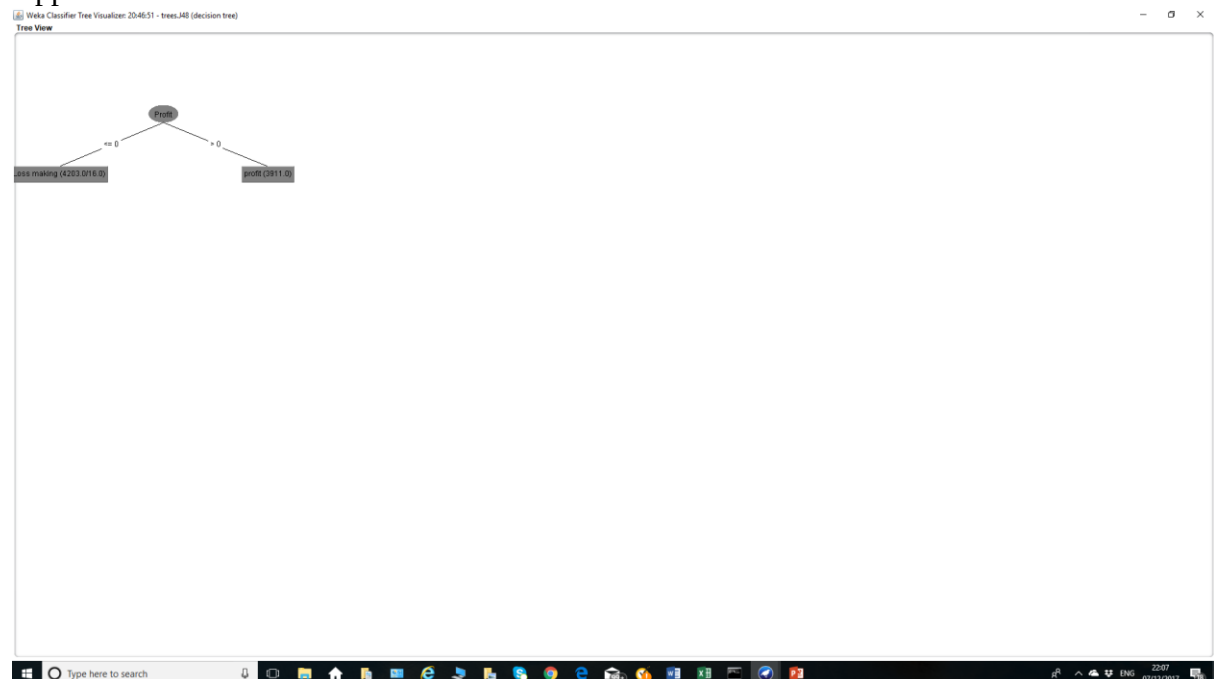


WEKA Appendices

Appendix WEKA 1



Appendix WEKA 2



Appendix WEKA 3

The screenshot shows the WEKA 3.9.3 Classifier window. The 'Test options' section has 'Use training set' selected. The 'Classifier output' section shows the following results:

```
Instances: 8114
Attributes: 4
Order Quantity
Sales
Profit
Profit or Loss
Test mode: evaluate on training data

=== Classifier model (full training set) ===

RandomForest

Bagging with 100 iterations and base learner
weka.classifiers.trees.RandomForest -E 0 -M 1.0 -V 0.001 -S 1 -do-not-check-capabilities

Time taken to build model: 1.08 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.62 seconds

=== Summary ===

Correctly Classified Instances      8113      99.9877 %
Incorrectly Classified Instances      1      0.0123 %
Kappa statistic                    0.9998
Mean absolute error                 0.001
Root mean squared error             0.0164
Relative absolute error              0.236 %
Root relative squared error          1.2359 %
Total Number of Instances          8114

=== Detailed Accuracy By Class ===

      TP Rate  FP Rate  Precision  Recall  F-Measure  MCC      ROC Area  PRC Area  Class
      1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000   Loss making
      1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000   profit
Weighted Avg.   1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000

=== Confusion Matrix ===

  a  b  <-- classified as
4196  1  a = Loss making
  3927 1  b = profit
```

Appendix WEKA 4

The screenshot shows the WEKA 4.8.1 Classifier window. The 'Test options' section has 'Use training set' selected. The 'Classifier output' section shows the following results:

```
Order Quantity < 41.5
Sales < 45.5 : Loss making (1/0)
Sales >= 45.5 : profit (4/0)
Order Quantity >= 41.5 : Loss making (1/0)
Sales >= 113.5
Profit < -0.3 : Loss making (1801/0)
Profit >= -0.3
Sales < 145 : Loss making (3/0)
Sales >= 145 : profit (1/0)
Profit >= 0.5 : profit (1597/0)
Sales >= 584.5
Profit < 0.5 : Loss making (1194/0)
Profit >= 0.5 : profit (2314/0)

Size of the tree : 45

Time taken to build model: 0.01 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.16 seconds

=== Summary ===

Correctly Classified Instances      8113      99.9877 %
Incorrectly Classified Instances      1      0.0123 %
Kappa statistic                    0.9998
Mean absolute error                 0.0001
Root mean squared error             0.0078
Relative absolute error              0.0247 %
Root relative squared error          1.8708 %
Total Number of Instances          8114

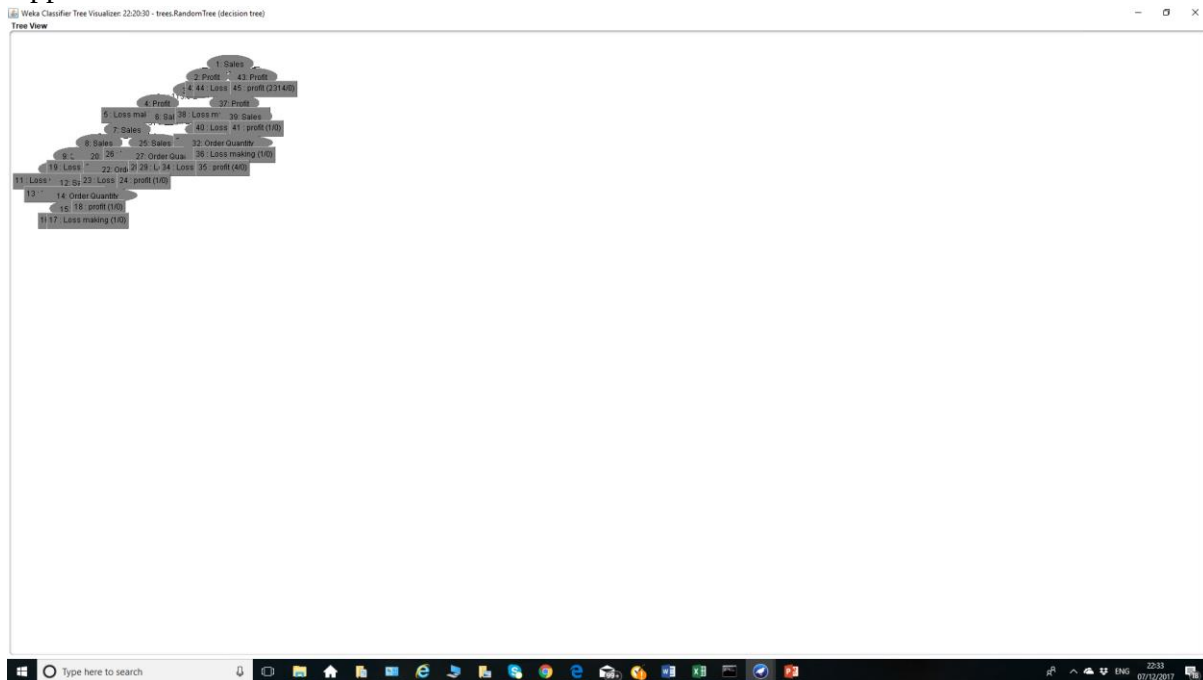
=== Detailed Accuracy By Class ===

      TP Rate  FP Rate  Precision  Recall  F-Measure  MCC      ROC Area  PRC Area  Class
      1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000   Loss making
      1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000   profit
Weighted Avg.   1.000   0.000   1.000     1.000   1.000     1.000   1.000    1.000

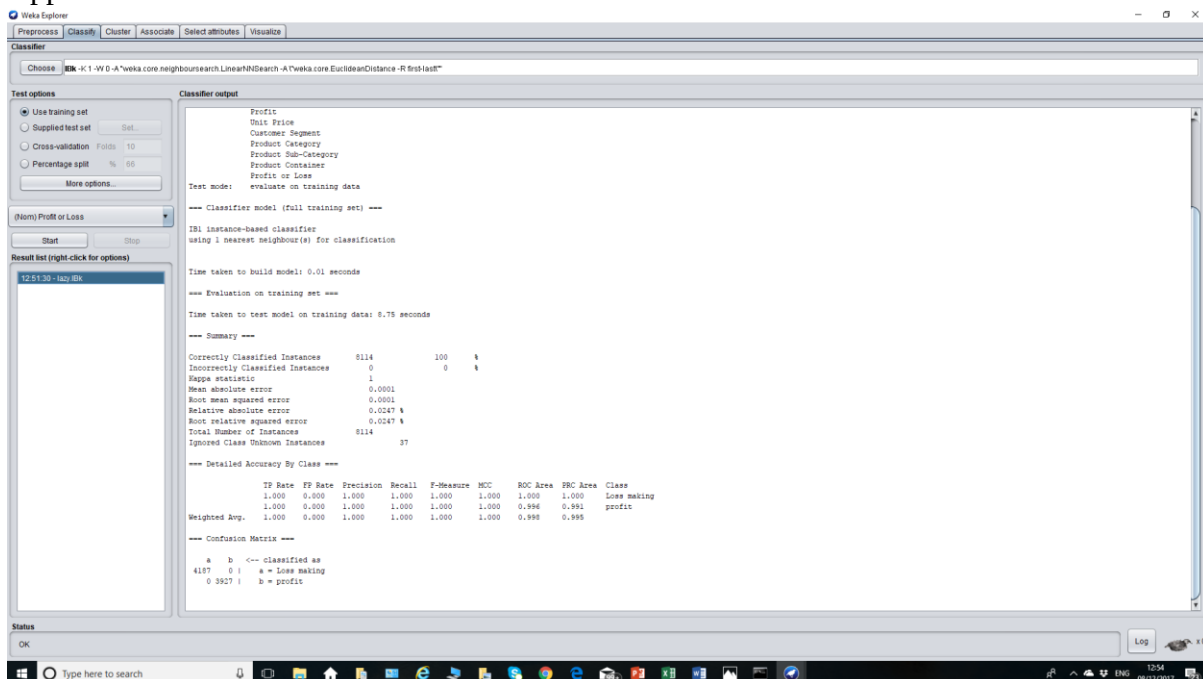
=== Confusion Matrix ===

  a  b  <-- classified as
4197  0  a = Loss making
  3926 1  b = profit
```

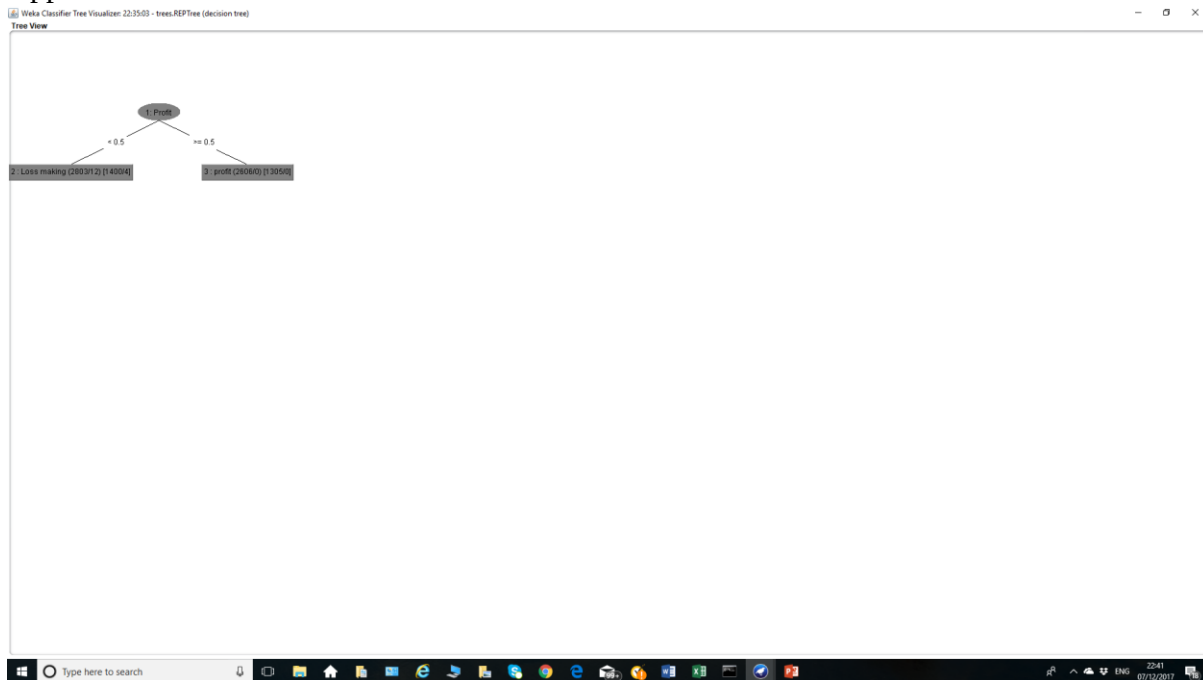
Appendix WEKA 5



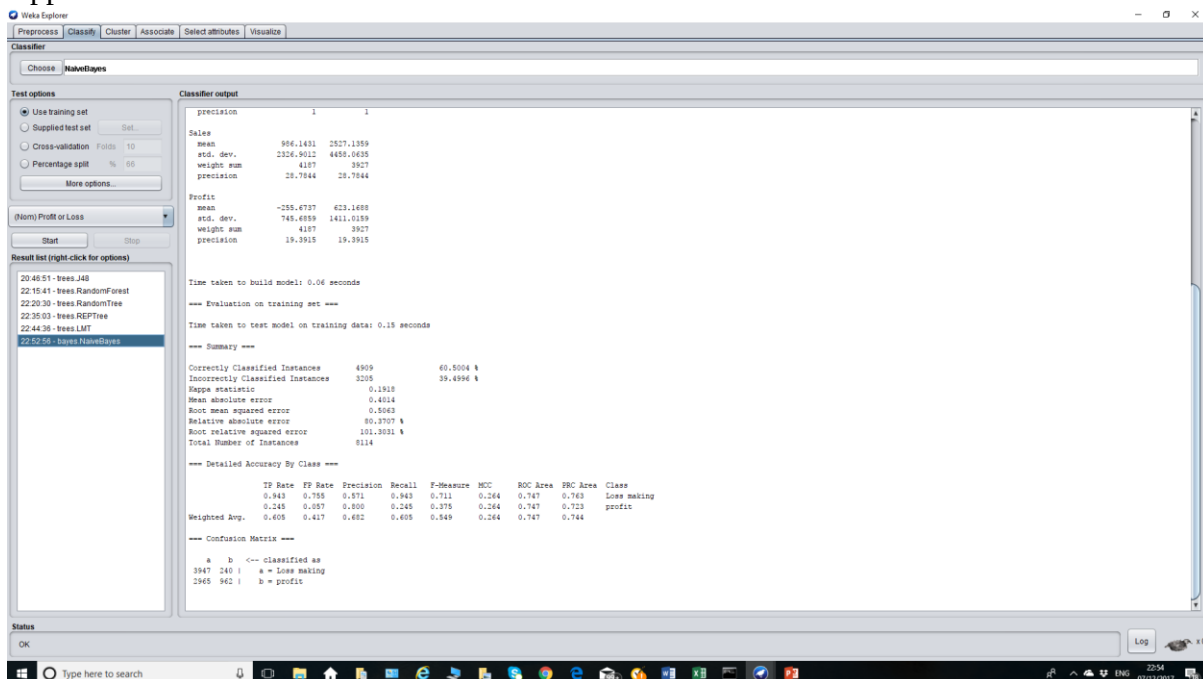
Appendix WEKA 6



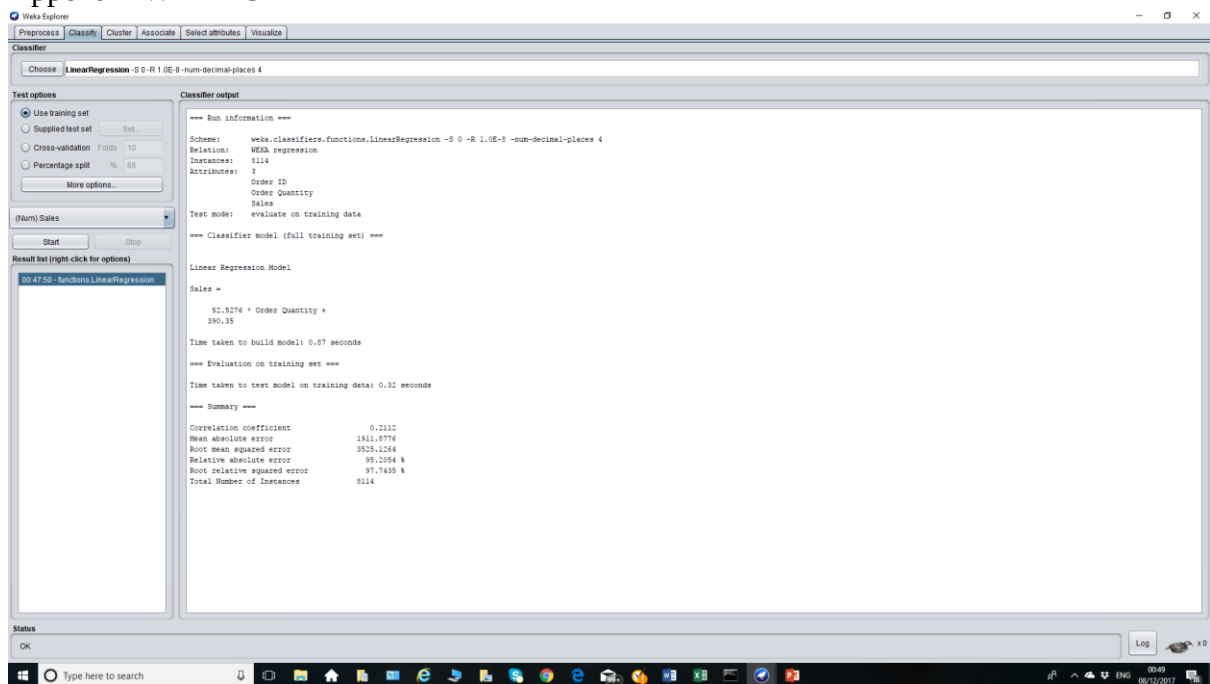
Appendix WEKA 7



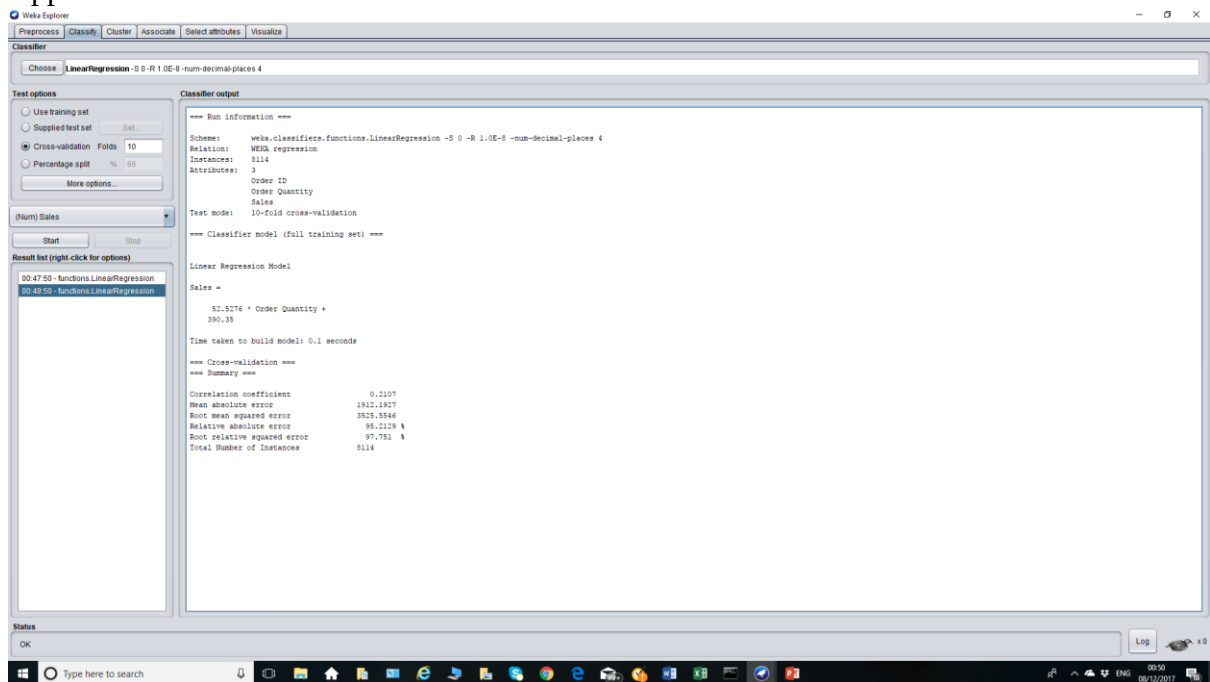
Appendix WEKA 8



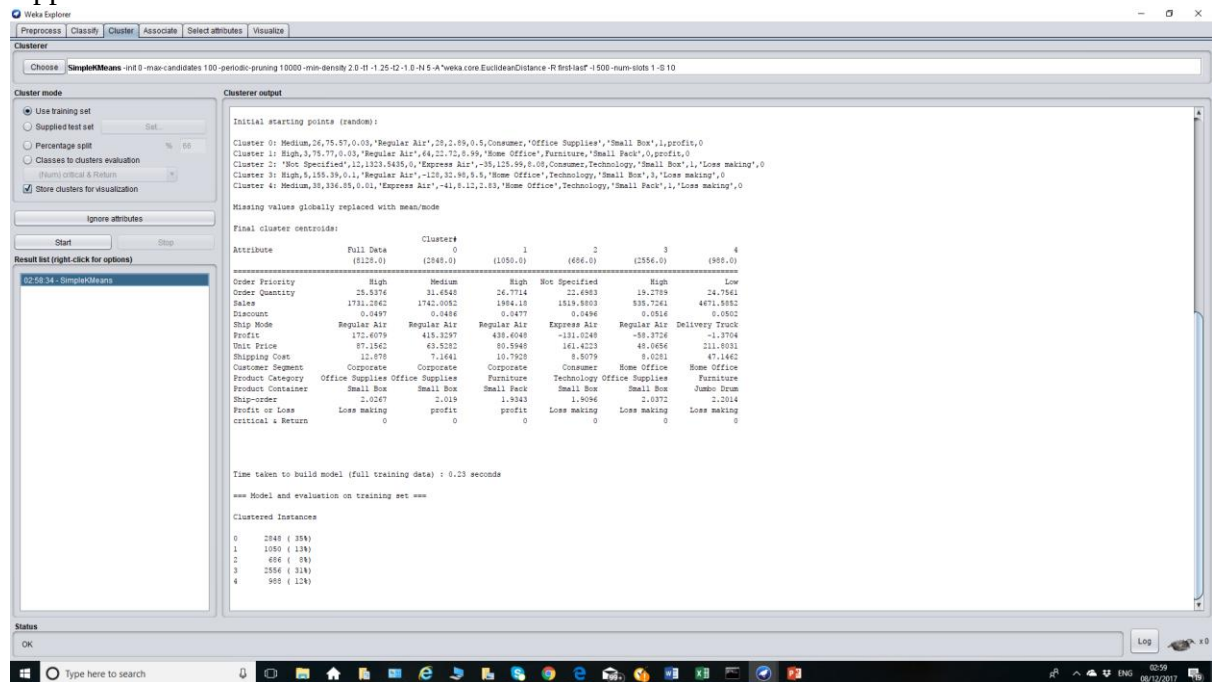
Appendix WEKA 9



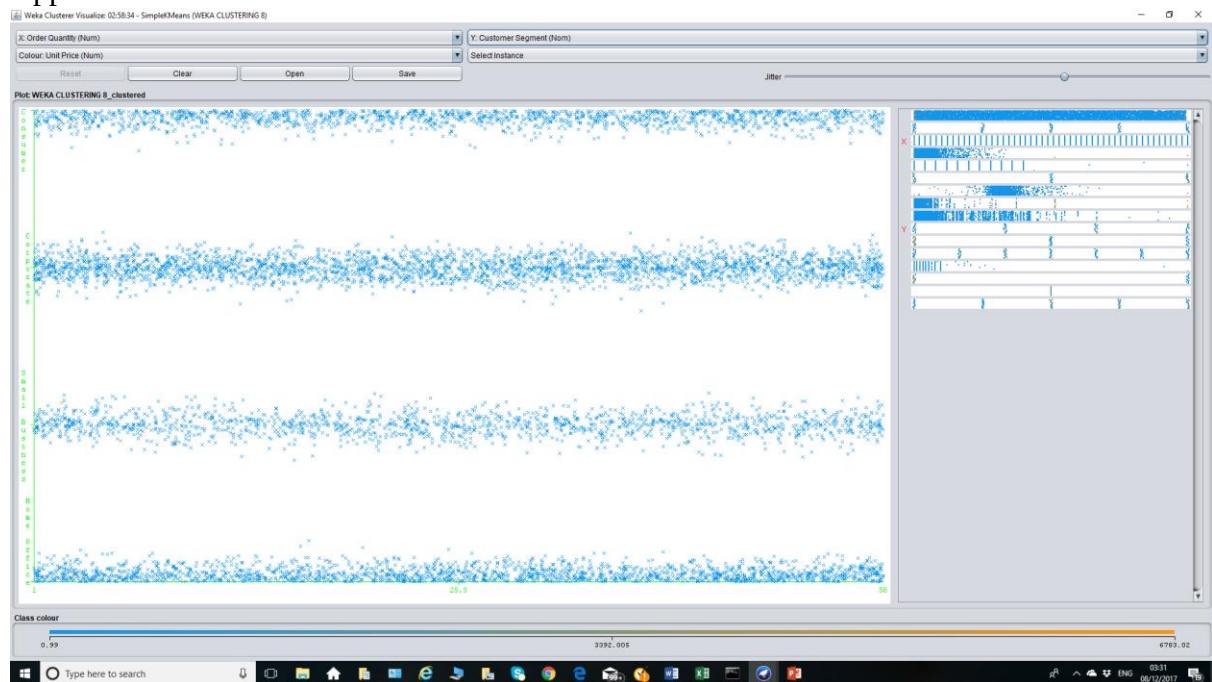
Appendix WEKA 10



Appendix WEKA 11



Appendix WEKA 12



Appendix WEKA 13

List of lines and columns deleted

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Product sub category, product base margin, customer name, Province, Region, ID row, dates, price review, Revenue, Product name, % of sales etc were deleted, return items, quality checked, New sales invoices and invoice discrepancies.

Appendix WEKA 14

