



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

LEVEL/ LEFEL: 4

MODULE CODE/ COD Y MODIWL: ACCB4002
Data Analysis and Visualisation

ASSESSMENT TYPE/ MATH O ASESU: COURSEWORK

ASSESSMENT/COMPONENT/ ASESAD/CYDRAN: 1

COMPONENT WEIGHTING/ PWYSAU'R CYDRAN: 50 %

WORD COUNT/ NIFER Y GEIRIAU: N/A

SUBMISSION DETAILS/ MANYLION CYFLWYNO:

- All files of the website and the database should be zipped and submitted electronically to Moodle.
- Make sure that Your Name , Your Student Number, Your Module Title, Assignment Title and Your Module Lecturer's Name are clearly shown on the front page of your assignment
- All assignments must be submitted electronically to Moodle and the report on Distributed Database has to be submitted through Turnitin.



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BACHELORS DEGREE ASSIGNMENT SPECIFICATION (SOAC)

Programme:	BSc Cloud Computing		
Assignment Title:	Data Analysis and Visualisation		
Hand Out Date:	2nd Week of Term	Submission deadline:	Please refer to the assessments schedule published on Students' Hall in Moodle and the Assessment Board on campus

Referencing:	In the main body of your submission you must give credit to authors on whose research your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have read or quoted in order to complete this assignment (e.g. for books: surname of author and initials, year of publication, <u>title of book</u> , edition, publisher: place of publication).
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Late submission will result in a late penalty mark, as follows:

**Up to one week late, maximum mark of 40% for first attempts and 0% for resubmissions. No work will be accepted more than one week after the submission deadline
(Academic Quality Handbook 2016/17 7.5 (5))**

Module Learning Outcomes:

1. Select and apply appropriate statistical methods for the analysis of well-defined problems
2. Demonstrate an ability to present nominal, ordinal, categorical and network data in forms that enable the easy understanding of the data
3. Demonstrate an ability to rearrange data in order to extract hidden information
4. Apply colour, position, size, shape and icons to encode information creatively and effectively to solve well-defined problems in information visualisation

TASK DESCRIPTION

Task 1: 50% of the total mark

Consider “Where is Coronavirus Rising & Falling?” infographic available on moodle. Write a short (about 1000 word) discussion of how this is a means for presenting the information it contains. You should include any particular good features of the poster, any opportunities you have identified on the infographic, any problems that you have identified, and your ideas for improving the design by redesigning the infographic (if necessary).

Task 2: 50% of the total mark

The data in the file “DV Assignment Dataset 2017-2018.xlsx” (available on moodle) comes from the Monthly Accident & Emergency Report published by NHS Wales Informatics Service: “Time Spent in NHS Wales Accident and Emergency Departments: Monthly Management Information” (original data available online at <https://statswales.gov.wales/Catalogue/Health-and-Social-Care/NHS-Hospital-Waiting-Times/Accident-and-Emergency/performanceagainst12hourtargetallemergencycarefacilities-by-localhealthboard>). It shows the number of people attending A&E within the various health authorities in Wales.

The data shows the number of patients treated each month during the three months from March 2017 to May 2017 at hospitals within each health board. It also gives the number and percentage of those patients who were treated within 4, 8, and 12 hours.

Based upon this data, create an A3 colour poster that allows viewers to easily answer the following questions:

1. How has the total number of patients seen in each area varied over the period?
2. How have the proportions of patients treated within 4 hours, 8 hours, 12 hours and over 12 hours varied in Wales over the period?
3. Do smaller health boards have better treatment times?
4. Assuming that they have an injury that could be treated at any hospital, in which health board area are they most likely to have to wait over 12 hours?

5. Assuming that they have an injury that could be treated at any hospital, in which health board area are they most likely to have to wait less than 4 hours?

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

Task 1

You may find it helpful to print out the graphic in colour on A3 paper and look at it at arm's length.

Your discussion should consider the following aspects of visualisation design:

- What message is the poster trying to provide?
- Colour – Can you see everything? Do the colours fit the subject?
- Text – Can you read everything? Are there too many fonts or styles of text? Is the text too large or too small?
- Graphs – Are the graphs easy to read? Are they of a suitable type for the data that they're being used to display?
- Graphics – Are there graphics that don't provide information? If so, are they harmless or do they actively prevent you from seeing information that is being presented? Is the overall design good or bad? Does it raise any ethical issues?
- Cognition – Does it put any unnecessary demands on the viewer in terms of memory load, perception or mental modelling?
- Improvements – How would you improve the infographic? Remember to explain how this would solve any problems previously identified. You may include a rough sketch of any redesigned areas of the graphic if you wish.

In each case, you should support your decisions with references to the research literature. You should aim for 5-10 reference sources for this purpose and at least half of them should be books or journal papers.

Marks will be awarded for:

- ❖ (50%) Identifying good practice and problems with the following:
 - Colour
 - Text
 - Graphs
 - Graphics
 - Cognition
 - Explaining the problems with reference to the literature.
- ❖ (25%) Improving the infographic
 - Identifying the message
 - Identifying practical improvements
 - Explaining those improvements with reference to the literature.
- ❖ (15%) Document presentation
 - Layout, structure
 - Appropriate use of examples
 - Readability, spelling, grammar.
 - Word count (1000 words $\pm$ 10%)
- ❖ (10%) References
 - Number and quality of references.

Task 2

You should create an A3 poster that includes graphics that allow the viewer to easily answer all of the questions given. Templates are available on Moodle for A3 posters in Microsoft Word and Microsoft Powerpoint formats. The poster may have either landscape or portrait orientation and should contain computer-generated (**not** hand-drawn) graphics. Both Tableau and IBM's "ManyEyes" website has many different types of visualisations that you may find useful.

Marks will be awarded for:

- ❖ (50%) Presentation of data
 - Appropriate display methods
 - Accurate data
 - Answers all questions set
- ❖ (40%) Infographic design
 - Use of text
 - Use of colour
 - Use of graphics
 - Use of white space
- ❖ (10%) Creativity
 - Is it aesthetically pleasing or, at least, elegant in its simplicity?

WHAT YOU SHOULD SUBMIT

The report (MS Word format) and the poster (pdf format) (but not the assignment specification) should be submitted via Turnitin.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Task 1

QUESTION	EXCEPTIONAL 85-100	MERITORIOUS 70-84	HIGHLY COMPETENT 60-69	COMPETENT 50-59	PASS 40-49	FAIL 0-39
Description of what is wrong with the original poster (40%)	Provides detailed breakdown of cognitive errors in data presentation	Identifies a wide range of problems	Explains all identified problems in terms of cognitive processes	Discusses one or two problems with reference to cognitive processes	Identifies three to six obvious problems	Identifies two or fewer problems.
Suggestion of improvements (30%)	Provides detailed breakdown of cognitive support in data presentation	Suggests a wide range of justified improvements	Justifies the main improvements in terms of cognitive processes	Suggests three to six appropriate improvements	Suggests one or two obvious improvements	Makes no suggestions for how to improve the poster
Links to literature (10%)	All points referenced	Most points referenced	Considers cognitive issues	Considers other issues	Considers visual issues	No links to the literature
Document presentation (10%)	Reads like a technical review article	Good use of signposting; good use of English; tables of figures and tables	Clear sectioning of content; labelling of tables and figures; reasonable English	Some labelling of tables and figures; clearly needs spell- and grammar-checking	Basic use of introduction, body and conclusion; English is comprehensible.	No clear structure; incomprehensible
Referencing (10%)	>10 references AND three quarters or more of references are book/journal standard	>4 references AND three quarters or more of references are book/journal standard	<5 references AND more than half of references are book/journal standard	<5 references OR fewer than half of references are book/journal standard	<5 references AND fewer than half of references are book/journal standard	No references

Part 2

QUESTION	EXCEPTIONAL 6	MERITORIOUS 5	HIGHLY COMPETENT 4	COMPETENT 3	PASS 2	FAIL 1
Presentation of data (35%)	All forms are highly effective and accurate	Most forms are highly effective and accurate	Some forms are highly effective and accurate	Uses multiple appropriate graph forms with accurate data	Uses the same graph form without, or uses wildly inaccurate data	Uses totally inappropriate forms
Answers questions (15%)	Answers all questions effectively	Answers 4 questions effectively with no major problems in other	Answers 3 questions effectively with no major problems in others	Answers 3 questions effectively	Answers 2 questions effectively	Answers only 1 or no questions effectively
Use of colour (20%)	Professional-looking design	All colours are used appropriately and allow for limits of visual system	All colours are used appropriately	Most colours are visible	Some colours are readable	Unreadable
Use of other elements (20%)	Professional-looking design	All elements are used appropriately and allow for limits of visual system	All elements are used appropriately	Text is a sensible size and well-spaced	Text is readable but in an inappropriate manner.	Unreadable
Creativity (10%)	Professional-looking design	Most graphic design elements work well	Aesthetically pleasing/elegant in its simplicity	Some graphic design elements that work well	Plain, with no attempt to add graphic design elements	Ugly