

Module: Software Development

Module Code: ACCB4017

Lecturer: Dr. Muhammad Azeem Abbas

Internal Verifier: Dr. Charles Vincent

Assignment Title: Software Development Task 1

Student ID: 2113437

Student Name: Carol Cernea

Part A

A1.

List is a collection of index values pairs as the array. List need to be homogenous always wich makes it most powerful tool in Python. A single list can contain 'DataTypes' like Intengers, Strings. List is creating by placing elements in "["]" and separated by commas ",".

Example of List: `List = ["Car", "Money", "Things"]`

Dictionary is unorder collection of data values and is used to store data values. Dictionaries are created by placing element in "{"}" and separated by commas ",".

Example of List: `Dict = {1:'Car', 2:'Money', 3:'Things'}`

Differences between List and Dictionary:

List	Dictionary
The indices of list are integers starting from 0.	The keys of dictionary can be of any data type.
The order of the elements entered are maintained.	There is no guarantee for maintaining order.
List is created by placing elements in [] separated by commas ","	Dictionary is created by placing elements in { } as "key": "value", each key value pair is separated by commas ","

#Example of list

```
list = ["append", "count", "pop", "remove", "sort"]
```

```
N = len(list)
```

```
print('list')
```

```
for i in range (0,N):
    print(list[i])
```

<pre> 1 list = ["append","count","pop","remove","sort"] 2 3 N = len(list) 4 5 print('list') 6 7 for i in range (0,N): 8 print(list[i]) 9 10 </pre>	<pre> list append count pop remove sort > </pre>
--	---

The 'user-defined functions' are very important because allow us as a programmers to create own procedures and routine that the computer can follow. Breaking the code in small functions keep the code organized and more easy to understand and to be read.

Example:

<pre> 1 def sum(num1,num2): 2 return num1-num2 3 x=sum(25,32) 4 y=sum(2,54) 5 print(x,y) </pre>	<pre> -7 -52 > </pre>
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Part B

Exercise 1:

Show how variables can contain different types of values by using four variables to hold a product title, a product model-number, price, and category. Write a programme to allow the user to input these values and then display them on the screen. The variables should be appropriately typed for the data required.

Python Code:

```
print("Hello, this program is part of Carol Cernea Project!")
Title = str(input("Enter Product Title: "))
Product = int(input("Enter Product Number: "))
Price = float(input("Enter product price: £ "))
Category = str(input("Enter product category: "))

# Display all values on screen
print("\n")
print("Printing Input Details")
print("Title", "Product", "Price", "Category")
print(Title, Product, Price, Category)
```

main.py	Shell
<pre> 1 print("Hello, this program is part of Carol Cernea Project!") 2 Title = str(input("Enter Product Title: ")) 3 Product = int(input("Enter Product Number: ")) 4 Price = float(input("Enter product price: £ ")) 5 Category = str(input("Enter product category: ")) 6 7 # Display all values on screen 8 print("\n") 9 print("Printing Input Details") 10 print("Title", "Product", "Price", "Category") 11 print(Title, Product, Price, Category) </pre>	<pre> Hello, this program is part of Carol Cernea Project! Enter Product Title: iphone Enter Product Number: 11 Enter product price: £ 1200 Enter product category: smartphone Printing Input Details Title Product Price Category iphone 11 1200.0 smartphone > </pre>

Exercise 2:

Design and construct a programme to allow the user to enter the width and height to calculate area of each rectangle (that is, blue, red, green, black and yellow) using a user-defined areaRectangle function.

<pre> 1 print("Hello, this program is part of Carol Cernea's Project!") 2 3 w = float(input('Please Enter the Width: ')) 4 h = float(input('Please Enter the Height: ')) 5 6 # to calculate area 7 Area = w * h 8 9 # to calculate the perimeter 10 Perimeter = 2 * (w + h) 11 12 print("\n Area of a Rectangle is: %.2f" % Area) 13 print(" Perimeter of Rectangle is: %.2f" % Perimeter) </pre>	<pre> Hello, this program is part of Carol Cernea's Project! Please Enter the Width: 8 Please Enter the Height: 4 Area of a Rectangle is: 32.00 Perimeter of Rectangle is: 24.00 > </pre>
---	--

main.py



Run

Shell

```
1 print("Hello, this program is part of Carol Cernea Project!")
2
3 #To calculate Area
4 #Area = w * h
5 def rectangle_area(width, height):
6     blue = width * height
7     red = blue / 2
8     green = red / 2
9     black = green / 2
10    yellow = black
11    return blue, red, green, black, yellow
12
13
14 w = float(input('Please Enter the Width:'))
15 h = float(input('Please Enter the Height'))
16 width = float(w)
17 height = float(h)
18 blue, red, green, black, yellow = rectangle_area(width, height)
19
20 print('The area of whole Rectangle is:', blue)
21 print('The area of red rectangle is', red)
22 print('The area of green rectangle is', green)
23 print('The area of black rectangle is', black)
24 print('The area of yellow rectangle is', yellow)
```

```
Hello, this program is part of Carol Cernea Project!
Please Enter the Width:8
Please Enter the Height:4
The area of whole Rectangle is: 32.0
The area of red rectangle is 16.0
The area of green rectangle is 8.0
The area of black rectangle is 4.0
The area of yellow rectangle is 4.0
> |
```

Python Code:

```
print("Hello, this program is part of Carol Cernea Project!")

#To calculate Area
#Area = w * h
def rectangle_area(width, height):
    blue = width * height
    red = blue / 2
    green = red / 2
    black = green / 2
    yellow = black
    return blue, red, green, black, yellow

w = float(input('Please Enter the Width:'))
h = float(input('Please Enter the Height:'))
width = float(w)
height = float(h)
blue, red, green, black, yellow = rectangle_area(width, height)

print('The area of whole Rectangle is:', blue)
print('The area of red rectangle is', red)
print('The area of green rectangle is', green)
print('The area of black rectangle is', black)
print('The area of yellow rectangle is', yellow)
```

Exercise 3:

Python Code:

```
print("Hello, this program is part of Carol Cernea Project!")
Name = ["Prius", "Corsa", "Tesla", "Mini", "A-Class"]
Model = [2015, 2018, 2020, 2010, 2016]
Type = ["Hatchback", "SUV", "Sedan", "Micro", "Sedan"]
Price = [6000, 30000, 55040, 33000, 50000]

N = len(Name)

print('Name\t\t', 'Model', '\t\t Type', '\t\t\tPrice')

for i in range(0, N):
    print(Name[i], '\t\t', Model[i], '\t\t', Type[i], '\t\t', Price[i])
x = sum(Price)
hatchback=Price[0]
suv=Price[1]
sedan=Price[2]+Price[4]
micro=Price[3]
year2015orBelow=Price[0]+Price[3]
year2015orAbove=Price[1]+Price[2]+Price[4]

# Calculate the average price of sedan type cars, average price of cars
other than sedan type, average price of cars of model 2015 and below,
and average price of cars above 2015 model
print('1. The average price of Sedan cars:', sedan/2)
print('2. The average price of Sedan cars:', hatchback+suv+micro/3)
print('3. The average price of 2015 cars or below:', year2015orBelow/2)
print('3. The average price of 2015 cars or above:', year2015orAbove/3)
```

Project Files

- C:\Users\Carol Cernea\PycharmProjects\pythonProject
 - .idea
 - venv
 - Data01.csv
 - Iris.csv
 - main.py

```

21
22 # Calculate the average price of sedan type cars, average price of cars other than sedan type, average price
23 print('1. The average price of Sedan cars:', sedan/2)
24 print('2. The average price of Sedan cars:', hatchback+suv+micro/3)
25 print('3. The average price of 2015 cars or below:', year2015orBelow/2)
26 print('3. The average price of 2015 cars or above:', year2015orAbove/3)

```

Run: main

"C:\Users\Carol Cernea\PycharmProjects\pythonProject\venv\Scripts\python.exe" "C:/Users/Carol Cernea/PycharmProjects/pythonProject/main.py"

Hello, this program is part of Carol Cernea Project!

Name	Model	Type	Price
Prius	2015	Hatchback	6000
Corsa	2018	SUV	30000
Tesla	2020	Sedan	55040
Mini	2010	Micro	33000
A-Class	2016	Sedan	50000

1. The average price of Sedan cars: 52520.0
 2. The average price of Sedan cars: 47000.0
 3. The average price of 2015 cars or below: 19500.0
 3. The average price of 2015 cars or above: 45013.33333333336

Process finished with exit code 0

"C:\Users\Carol Cernea\PycharmProjects\pythonProject\venv\Scripts\python.exe" "C:/Users/Carol Cernea/PycharmProjects/pythonProject/main.py"

Hello, this program is part of Carol Cernea Project!

Name	Model	Type	Price
Prius	2015	Hatchback	6000
Corsa	2018	SUV	30000
Tesla	2020	Sedan	55040
Mini	2010	Micro	33000
A-Class	2016	Sedan	50000

1. The average price of Sedan cars: 52520.0
 2. The average price of Sedan cars: 47000.0
 3. The average price of 2015 cars or below: 19500.0
 3. The average price of 2015 cars or above: 45013.33333333336

Process finished with exit code 0

```
1 print("Hello, this program is part of Carol Cernea Project!")
2 Name = ["Prius","Corsa","Tesla","Mini","A-Class"]
3 Model = [2015,2018,2020,2010,2016]
4 Type = ["Hatchback","SUV","Sedan","Micro","Sedan"]
5 Price = [6000,30000,55040,33000,50000]
6
7
8 N = len(Name)
9
10 print('Name\t\t\t','Model','\t\t\t Type','\t\t\t\tPrice')
11
12 for i in range (0,N):
13     print(Name[i],'\t\t\t',Model[i],'\t\t\t' ,Type[i],'\t\t\t' ,Price[i])
14 x = sum(Price)
15 hatchback=Price[0]
16 suv=Price[1]
17 sedan=Price[2]+Price[4]
18 micro=Price[3]
19 year2015orBelow=Price[0]+Price[3]
20 year2015orAbove=Price[1]+Price[2]+Price[4]
21
22 # Calculate the average price of sedan type cars, average price of cars other than sedan type,
    average price of cars of model 2015 and below, and average price of cars above 2015 model
23 print('1. The average price of Sedan cars:', sedan/2)
24 print('2. The average price of Sedan cars:', hatchback+suv+micro/3)
25 print('3. The average price of 2015 cars or below:', year2015orBelow/2)
26 print('3. The average price of 2015 cars or above:', year2015orAbove/3)
27
28
29
```

Exercise 4:

```
print("Hello, this program is part of Carol Cernea Project!")

print("Let's spin!")
import random
import os
import time
points=0
def refresh():
    time.sleep(3)
    os.system('clear')

def main():
    global die1,die2,die3
    die1=random.randint(1,3)
    die2=random.randint(1,3)
    die3=random.randint(1,3)
    print(f"Numbers are:{die1} * {die2} * {die3}")
    marks(die1,die2,die3)
def marks(die1,die2,die3):
    global points
    if die1==die2==die3:
        points+=0
    elif die1==die1 or die2==die2 or die3==die3:
        points+=2
    else:
        points+=3
    print(f"\nAfter this turn, your points are: {points}\n")
    refresh()

main()
```

```

print("Hello, this program is part of Carol Cernea Project!")

print("Let's spin!")
import random
import os
import time
points=0
def refresh():
    time.sleep(3)
    os.system('clear')

def main():
    global die1,die2,die3
    die1=random.randint(1,3)
    die2=random.randint(1,3)
    die3=random.randint(1,3)
    print(f"Numbers are:{die1} * {die2} * {die3}")
    marks(die1,die2,die3)
def marks(die1,die2,die3):
    global points
    if die1==die2==die3:
        points+=0
    elif die1==die1 or die2==die2 or die3==die3:
        points+=5
    else:
        points-=3
    print(f"\nAfter this turn, your points are: {points}\n")
    refresh()

main()

```

```

"C:\Users\Carol Cernea\PycharmProjects\pythonProject\venv\Scripts\python.exe" "
Hello, this program is part of Carol Cernea Project!
Let's spin!
Numbers are:1 * 2 * 2

After this turn, your points are: 2

```

```

"C:\Users\Carol Cernea\PycharmProjects\pythonProject\venv\Scripts\python.exe" "C:/Users/Carol Cernea/PycharmProjects/pythonProject/main.py"
Hello, this program is part of Carol Cernea Project!
Let's spin!
Numbers are:3 * 3 * 3

After this turn, your points are: 0

```