NorthTec
TAI TOKERAU WĀNANGA

Qualification	New Zealand Diploma in Web Development and Design
Course	5002 Fundamentals of Programming and Problem Solving
Level	5
Assessment Number	1 (Assignment)
Assessment Version	V1
Semester & Year	S2, 2018
Campus	Auckland

Assessment	Date	Time allowed/Due Date	Submission type
Assignment	31 Oct 2018	Due: 2.30 pm, Tuesday. 27	Upload your files to Moodle in a zipped folder

Learning Outcomes	1. Apply programming concepts and tools to system management tasks. 2. Demonstrate awareness of procedural programming. 3. Apply principles of implementation (user testing, deployment). 4. Demonstrate programming using core logic and mathematical concepts such as problem solving methods, critical thinking, abstract reasoning; and systems thinking.	Total Weighting 100%

Learning Outcome	Task	Marks Available	Weighting	Marks Awarded
1	1	20	20%	/20
4	2	20	20%	/20
2,4	3	20	20%	/20
2,4	4	20	20%	/20
3	5	10	10%	/10
2,4	6	10	10%	/10
Total marks		100	100%	/100

Tutor/Assessor		
Marks:	Grade:	

Assessment Instructions:

- ➢ This is an individual project. It must be your own work.
- ➢ Do not copy the source codes or project of others.
- ➢ Complete the student declaration and submit it as part of your answer
- ➢ Complete all tasks.
- ➢ Take note of the due date/time to complete. If you have circumstances that mean you cannot complete the work on time discuss it with your tutor **before** the due date.
- ➢ Work submitted after due date, without prior negotiation with the tutor or programme leader will not be marked. (Please, refer to NZDSD, NZDWDD programme regulations).
- ➢ The name of your project Folder should be labelled by your student ID.

STUDENT DECLARATION

Assignment Project Exam Help

I declare that this is my own work.

If this assessment tering my student
ID below, this https://eduassistpro.github.io/ ity as assigned

Student ID:	Add WeChat edu_assist_pro
Date:	

Assessment Requirements

This assignment covers all learning outcomes. You are required to use both procedural and object-oriented programming principles to develop the applications of the case study provided below. You are required to elaborate the requirements of the application through applying tools like pseudocode, flow chart, and algorithm before implementing your case study in Python. To ascertain data entry integrity of the application, use any appropriate validation techniques to validate the input data. Moreover, you have to write your test cases for each of the classes by using test runner (unittest) capability of Python.

Case Study

SmallDuty is a New Zealand IT company pays its employees on a weekly basis. The employees are categorised in four categories:

*   **Salaried employees** are paid a fixed weekly salary regardless of the number of hours worked,
*   **Hourly paid employees** are paid by the hour and receive overtime pay (i.e., 1.5 times their hourly salary rate) for all hours worked more than 40 hours,
*   **Commission only employees** are paid a percentage of their sales and
*   **Base-salaried commission employees** receive a base salary plus a percentage of their sales.

For the current pay ~~be~~ *salaried commission* employees by addin ~~~~ you to write an application that performs its payroll calculations p

TASKS:

Part 1 (20 marks)

1. Illustrate OS module of the Python? How it provides a way of using operating system dependent functionality? Implement the given commands in Python with the proper justifications of the scenarios when they are required? **[LO1]**
   a. os.getcwd()
   b. os.getgid()
   c. os.getlogin()
   d. os.access()
   e. os.getsize()

Part 2 (20 marks)

2. Generate pseudocode, algorithm and flow chart for the above given case study and explain how they may help you in the actual implementation of the proposed applications? **[LO4]**

Part 3 (20 marks)

3. Write the applications in Python, use both procedural and Object-Oriented Programming techniques such as – encapsulation, inheritance, information hiding and polymorphism. These techniqu

To implement t~~...~~ superclass for all the employees call ~~...~~ hould inherit from this abstract class.
Hint: In order to ~~...~~ create subclasses a ~~...~~ HourlyEmployee, CommissionEmployee, of the abstract class Emp ~~...~~ ses should extend from the Employee abstract class.
Create a BasedPlusCommissionEmployee subclass of CommissionEmployee class.

[LO2,4]

Note: you must add comments to the code (methods, classes, variables).

Part 4 (20 marks)

4. Apply the validation of the data using the exception handling or if-else statements to validate input data. Write your application to validate the following data input.
   a. If the user enters weekly salary less than 0.0, the programme should prompt the user that weekly salary should be greater than 0.0.
   b. Ensure that for hourly wage employees' hours worked is between 0 – 65 hours (total hours of a week). Also, the wage per hour is not less than $16.50 (minimum wage). Error message
   c. Also, the commission of commission only employees entered should not be more than 100%.

[LO2, 4]

Note: you must add comments to the code (methods, classes, variables).

Part 5 (20 marks)

5. To test the applications, write test cases for each of the classes by using python Test runner (unittest). Every class must have at least one pass and fail scenarios.   **[LO3]**

Part 6 (10 Marks)

The output of your project should appear as the following (LO2, 4)

```
Employees processed individually:

salaried employee: John Smith
IRD Number: 102-034-506
weekly salary: $ 800.00
earned: $800.00

hourly employee: Karen Price
IRD Number: 113-145-106
hourly wage: $ 16.75, hours worked:  40.00
earned: $670.00

commission employee: Sue Jones
IRD Number: 103-
gross sales: $ 1
earned: $600.00

base-salaried commission employee: Bob Lewis
IRD Number: 104-020-305
gross sales: $ 5,000.00; commission rate: 0.04
earned: $500.00

Employees processed polymorphically:

salaried employee: John Smith
IRD Number: 102-034-506
weekly salary: $ 800.00
earned $800.00

hourly employee: Karen Price
IRD Number: 113-145-106
hourly wage: $ 16.75, hours worked:  40.00
earned $670.00

commission employee: Sue Jones
IRD Number: 103-040-606
gross sales: $ 10,000.00; commission rate: 0.06
earned $600.00

base-salaried commission employee: Bob Lewis
IRD Number: 104-020-305
gross sales: $ 5,000.00; commission rate: 0.04; base salary: $300.00
earned $530.00

Employee 0 is a Employee.SalariedEmployee
```

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Assignment Deliverables (100 marks)

Contents of Assignment Portfolio Your assignment folder should include:

Part		Criteria	Max Marks (sub-parts)	Given Marks (Sub-Parts)	Total Marks (Part)	Given Marks (Part)
1	Illustrate OS module of the Python? How it provides a way of using operating system dependent functionality? Implement the given commands in Python with the proper justifications of the scenarios when they are required? **[LO1]** a. os.getcwd() b. os.getgid() c. os.getlogin() d. os.access() e. os.getsize()	• Illustration of OS Module • Implementation of given commands with proper justification (1 mark for justification and 1 mark for implementation)	1 X 10=10 2 x5 =10		20	
2	Generate pseudocode, algorithm and flow chart for the above given case study and explain how they may help you in the actual implementation of the proposed applications?	• Pseudocode with expl marks) • Algorithm with explanation (5 +2 marks) • Flow chart with explanation (5 + 2 marks each)	=6 1 x7=7 1x7=7		20	
3	Write the applications in Python	• Create Five Classes (1 mark each) • Declare the data in the classes (1 marks each)	1 x 5 =5 1 x 5=5		20	

		• Implement a method in the classes (1 mark each)	1 x 5=5			
		• Good indentation of codes. (2 marks)	1 x 2=2			
		• Commenting on methods, classes and variables. (3 marks)	1 x3=3			
4	Validation of the data uses the exception handling or if-else statements to validate input data.	• Using "IF" AND "Exception handling" for the five classes. (3 marks each) • Good indentation of codes. (2	3x5=15 1x2=2 1x3=3		20	
5	To test the applications	• Test cases for each cla and 1 x Fail) (1 marks for Pass and 1 marks for Fail test cases)	=10		10	
6	Output	4 classes (1 mark for each class output), (4 marks) 1 mark for polymorphic output, 4 classes (4 marks) 2 marks for array output (2 marks)	1x4=4 1x4=4 1x2=2		10	
Total			/100		/100	

Submission instructions:

- You should upload two files
  1. Word file include your answers
  2. Project (compressed file contain the Python code)
- Submit your zipped folder to Moodle.
- Saving your assignment at the right size is important because large files (over 20MB) can be difficult or impossible to upload.

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