Assessment 3: Programming Project and Report

Due date:	Week 8
Group/individual:	Individual
Word count/Time provided:	Report 1000 words + Code (equiv. 2500 words)
Weighting:	40%
Unit Learning Outcomes:	ULO1, ULO3

Assessment 3 Detail

Task

Python Programming Assessment: Data Processing and Analysis

Project Objective:

The Python Programming Assessment aims to evaluate the students' proficiency in using functions and various data structures (lists, tuples, dictionaries) to process and analyse data. The project should demonstrate their understanding of programming concepts, data manipulation, and the effective use of functions and data structures.

Project Description:

You are assigned a data analysis project for a company named "DataTech Solutions." The company has provided you with a dataset containing information about their employees, and they require you to perform specific data analysis tasks. You will store the data directly in data structures within your Python program.

Dataset Structure:

The dataset consists of the following columns:

1. Employee ID (integer)
2. Employee Name (string)
3. Department (string)
4. Salary (float)
5. Years of Experience (integer)

Tasks: Create a Python program that uses data structures (lists, dictionaries) to perform the following tasks:

1. Load Data:

- Manually create a list of dictionaries to represent the dataset.

2. Display Employee Information:

- Create a function to display the information for a specific employee based on their Employee ID.
- Allow the user to input an Employee ID, and if the ID exists in the dataset, display the corresponding employee information.

3. Calculate Average Salary:

- Create an algorithm (called Algorithm 1) to calculate the following:
  - Calculate and display the average salary of all employees.

4. Department-wise Salary Distribution:

- Create an algorithm (called Algorithm 2) to calculate the following:
  - Create a function that displays the salary distribution for each department.
  - The output should show the total number of employees and the average salary for each department.

5. Identify High Experience Employees:

- Create a function that identifies employees with more than 10 years of experience.
- Display the names and departments of these high-experience employees.

6. Update Employee Salary:

- Create a function that allows the user to update the salary of a specific employee based on their Employee ID.
- Prompt the user for the Employee ID and the new salary.

Assessment Evaluation:

- Proper usage of functions, lists, dictionaries, and data processing.
- Correctness and accuracy of data analysis.
- Clear and structured output presentation.
- Error handling for user inputs.
- Overall code organization, readability, and adherence to Python best practices.

Your report will consist of:

1. Your algorithm (pseudocode)
2. Source code for your Python implementation

Assessments 3 Marking Criteria and Rubric

The assessment will be marked out of 100 and will be weighted 40% of the total unit mark. The marking criteria and rubric are shown on the following page.