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## COMP202: Object Oriented Programming C++

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Total Marks = 40

**Submission Deadline: Monday 13 June 2022 at 10:00am.**

**NB. You should submit ONLY ONE pdf file that contains all your source codes and outputs of the codes into blackboard. You code outputs should be screen printed from the compiler you are using, DO NOT type your code output. Also DO NOT submit word documents but convert word document to pdf and submit pdf file. Your source codes should have comments.**

1. Suppose you are hired to write a program for a particular bank. In this bank, there is the **Human Resource Department** which gets from the **customers**, name the customers, age of the customer and customer account number which is an 8 digit number. The Human Resource department stores this details about a customer and also displays this details. There is another department in this bank called Finance. The **Finance department** gets from the customer, the customer salary and customer income tax. The tax is a number between 1 and 100. The Finance department also displays the salary of the customer and the tax of the customer. There is another department in this bank called Payroll. The Payroll Department displays all the customer details from the Human Resource Department. The **Payroll Department** also displays the customer salary and tax from the Finance Department. The payroll Department also has a function that calculates the customer net salary which is  $\text{salary} \times \text{tax} / 100$  and displays this salary.

**Write a C++ program using classes and inheritance to write the code for this bank. Treat each department as a class [20]**

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2. Suppose you have a text file called notes.txt. You are provided with this notes.txt file on blackboard. Write a C++ code to display a word which appears most in notes.txt file and how many times the word appears. This is called word frequency. Your code should automatically find this word that appears most in the text file and also should automatically calculate how many times this word appears. Your code should be such that when I use it to count words from a file with million words, it should tell me which word appears most, this means I do not need to look at the file to know the word first. Your code should also count the number of characters in the word you found and also convert the word to all CAPS. Your code should also count the total number of words in the file.
- [20]

For example, suppose a text file has the following text:

Apple  
Mango  
Apple  
Apple

The code will read from this file then the output should look like this:

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The word that appears most is: Apple
Apple appears: 3 times
Number of characters: Apples has 5 characters
Word in ALL CAPS: APPLE
Total number of words in the file : 4
```

- Your code will be recompiled during marking to see if it give the output you found.
- You are to complete this assignment individually.
- It is reasonable to discuss with others possible general approaches to the given problems.

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- If there is a too much collaboration from your common discussion by looking at the solutions, in such instances of academic dishonesty may result in you getting zero marks for this piece of assignment.
- Do NOT let others see your solutions else you will be strickly pernalised.
- If someone cheats by using your work, you will be both penalized.
- Any similar code will be pernalised or marked as zero.
- No plagiarism will be entertained, if believed to have plagiarized you will be given a zero.
- Work that is submitted after the due date will be penalized.
- A student is expected to consult their TAs.