CSC213 : TEST 3
8 January 2023

Note:

1. *Only for students who wish to upgrade CA to at least 50%. In this regard, the Final CA for students who write TEST 3 will be capped at 50%*

PROBLEM:

A student results processing system captures details for all students and the marks obtained in all the courses they are enrolled in. At the end of each semester, a report for each course may be generated from the multiple files where the information is captured.

YOUR TASK

Your task is to design and implement a program that reads information stored in three text (.TXT) files, and extract a report for each course.

THE DATA

The data is stored in two text files. The content of the files is as explained below.

- **courses.TXT** – This file contains 37 unique course records. Each record is described by course code, course title and the weighting of the continuous assessment (CA) and examination marks. The weighting is a value between 0 and 1, and the sum of CA and examination weighting must be equal to 1.
- **enrolments.TXT** – Each student can register in one or more courses, and each course can be taken by many students. This file contains a record of each student identity number and the course codes for the courses they are registered in. For each registration, the CA and examination marks are also recorded. The file contains 148 unique enrolment records.

The figure that follows shows a sample of each of the two files. For testing purposes, electronic copies of the input files are provided. For testing purposes, electronic copies of the input files are provided.

enrolment.TXT

CourseId	StudentId	CAMark	exml
CSC111	604818	35	52
CSC211	542961	4	61
CSC242	778736	82	63
CSC341	952551	3	63
CSC111	340674	40	1
CSC211	320851	94	91
CSC242	587820	83	54
CSC272	935489	53	1
CSC111	663665	3	16

Courses.TXT

```
CODE     DESCRIPTION                                    CA_RATE EXAM_RATE
CSC111   Introduction_to_Computer_Science               0.40    0.60
CSC113   Intrduction_to_Information_Technology           0.40    0.60
CSC121   Communications_Fundamentals                     0.50    0.50
CSC112   Computer_Programming_I                          0.40    0.60
CSC203   Discrete_Mathematics                            0.40    0.60
CSC205   Probability_and_Statistics                      0.33    0.67
CSC101   Computer Skills Foundations                     0.60    0.40
CSC251   Human_Computer_Interaction                      0.40    0.60
CSC222   Computer_Architecture_&_Organization_I          0.40    0.60
```

QUESTION 1– 35 marks

Write pseudocode for a function that reads each course record in the **course.TXT** file and extracts and counts all corresponding/matching enrolment records (matched using unique student identity number) from the **enrolments.TXT** file. The function must take the names of the two files as arguments. The program should produce a course summary report that count the number of enrolments for each course and calculate averages for CA and EXAM marks in the following format:

```
COURSE SUMMARY STATISTICS
============================

=================================================================================
CODE    TITLE                      NUMBER OF STUDENTS    CA AVERAGE   EXAM AVERAGE
=================================================================================
------  ----------------------------  ---------             ---.--       ---.--
------  ----------------------------  ---------             ---.--       ---.--
------  ----------------------------  ---------             ---.--       ---.--
------  ----------------------------  ---------             ---.--       ---.--
------  ----------------------------  ---------             ---.--       ---.--
=================================================================================
TOTAL  NUMBER OF STUDENTS:----------
=================================================================================
```

The function simple loops through the COURSE files , and for course each record it then loops through the ENROLMENT file, finds all matching (match by course Id) enrolments for that course, and computes averages in the process.

QUESTION 2 - 60 marks

Translate your pseudocode (question 1 above) to an actual C++ function. The function is expected to take two parameters/arguments (that is the names of text files), and write to standard output. Where appropriate you are free to define additional utility functions or operators to help you write the code.

QUESTION 3 - 5 marks

Write a C++ main function that calls the function defined in Question 2 above,