MAKERERE UNIVERSITY
COLLEGE OF COMPUTING
SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY
Coursework 1
CSC 1102: Structured Programming and OOP

INSTRUCTIONS:

I. Deadline: 24th NOV 2023 at MIDNIGHT (The Deadline is fixed and CANNOT be extended).
II. Teamwork: Team work is encouraged
III. Deliverables: Two files with source code files plus a word document to which the output should be pushed

QUESTION ONE

As a developer, your classmate requests a Python program integrating a CGPA calculator and a basic calculator. The CGPA calculator computes the CGPA based on marks from four course units attempted in a semester. The calculate_cgpa function should take in a list of marks, grades represented as letters ('A', 'B', 'C', 'D', 'E', 'F'), and a list of corresponding credit units for these four course units that are attempted in a particular semester compute the CGPA. The basic calculator function should perform arithmetic operations such as addition, subtraction, multiplication, division on numbers generated from a unique student number combination:

Student numbers: 216022204, 216002204, 216007570, 216002774

Calculate sum: 216022204 + 216002204 + 216007570 + 216002774 = 864034752

Extracted values: CU1 = 64, CU2 = 03, CU3 = 47, CU4 = 52 from the student number sum by removing the extreme value '8' on the left.

Tasks:

a) Implement Python code using the functions calculate_cgpa and basic calculator to generate the CGPA, and output the results to a Word document file. **(40 Marks)**

b) Create Python classes for computing the CGPA and output the results to a word document file(creativity and inheritance are recommended) **(40 Marks)**

c) Save the results from both (a) and (b) to an output Word document file using file write functions and the **open()** function to open the file for writing. **(20 Marks)**

NB While handing in each group should hand in two python files and one word document file consisting of the output results from both (a) and (b). The courseunits that are to be used should be as follows and the formula to use for the CGPA is showcased below

Code	Course Name	LH	PH	CH	CU	Remark
CSK 1101	Communication Skills	45	30	60	4	Old
CSC 1102	Structured & Object-Oriented Programming	30	60	60	4	New
CSC 1104	Computer Architecture & Organisation	30	60	60	4	Modified
CSC 1105	Mathematics for Computer Science	30	60	60	4	New

Marks	Letter Grade	Grade Point (GP)
90 - 100	A+	5.0
80 - 89	A	5.0
75 - 79	B+	4.5
70 - 74	B	4.0
65 - 69	C+	3.5
60 - 64	C	3
55 - 59	D+	2.5
50 - 54	D	2.0
45 - 49	E	1.5
40 - 44	E-	1.0
Below 40	F	0.0

Use the following formula to calculate CGPA:

Calculation of Cumulative Grade Point Average (CGPA)

The CGPA shall be calculated as follows:-

$$CGPA = \frac{\sum_{i=1}^{n} GP_i \times CU_i}{\sum_{i=1}^{n} CU_i}$$

Where GP_i is the Grade Point score of a particular course unit i; CU_i is the number of Credit Units of course unit i; and n is the number of course units done so far.