

CSC211-Programming Fundamentals (Lab)

Fall 2021

FA21-BSE/BCS-B

Assignment # 2

Deadline: 29th October, 2021 (Till 12:00 am)

Instructions (To be followed very strictly):

- Assignment will not be considered after the mentioned deadline.
 - You are required to submit your assignment with inputs and outputs exactly as stated in the assignment description.
 - In case of cheating, all involved will get a straight “ZERO”
 - Comment your code generously.
 - All the files should be zipped into a single file before sending (note: only use *.zip/rar format)
 - Copy and paste your code from your IDE to MS word and attach screenshot of the output at the end
 - Rename your main.c and MS word document with your roll number as follows
 - Sp20-rcs-005.c and sp20-rcs-005.docx
 - **(Mandatory)** Upload the assignment in response to Assignment in the google classroom
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Program Name: GPA-CGPA of Student

Problem Statement: Write down a program to calculate the CGPA of a student after certain number of semesters. The program first inputs the number of semester, which the student has completed so far. The number of semesters may range from 1 to 8. If the student enters an invalid semester, loop again until he enters correct semester number (HINT: use a sentinel controlled while loop to do this).

Then, it should ask the user to input marks in the subjects taken in each semester. The student may have taken variable number of subjects in each semester, which may vary from 1 to 7. The user may either enter the marks of all the 7 subjects taken in a semester, or input -1 in place of marks in order to exit before entering the marks of all the 7 subjects. The marks should be in [0-100] range. If the student enters an invalid marks for a subject, then assign 50 marks to that subject. The program should also display the grade of each subject, as soon as the student enters the marks of that subject. To calculate the grade, follow COMSATS rules.

Grades	Credit Points	Percentage Marks
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A	3.67 - 4.0	85 and above
A-	3.34 - 3.66	80-84
B+	3.01 - 3.33	75-79
B	2.67 - 3.00	71-74
B-	2.34 - 2.66	68-70
C+	2.01 - 2.33	64-67
C	1.67 - 2.0	61-63
C-	1.31 - 1.66	58-60
D+	1.01 - 1.30	54-57
D	0.10 - 1.00	50-53
F	0.00	Below 50

When all the subjects in a semester have been entered, display student's GPA in that semester. To calculate the GPA, follow COMSATS rules. At the end of each semester, also check for the rules given at bottom of this statement. After the marks of all the subjects in a particular semester are entered, the program now asks for students' marks in next semester and proceeds in a similar manner as described above.

Rules to check at the end of each semester:

1. Probation warning in a semester, if the GPA of a student is less than 2
2. In the case of 2 probations in consecutive semesters, DI rule in the first half (i.e. first 4 semesters) of the degree. In this case, simply display a message to the user that he cannot continue his degree and exit the program.
3. In the case of 2 probations in consecutive semesters, Semester Repeat in the second half of the degree. In this case, simply show a message to user to repeat the semester and exit the program. No need to reenter the marks in that semester again.

Formula to Compute Semester GPA:

Suppose a student has registered 3 subjects and obtain marks as follows:

Subject 1: 50

Subject 2: 75

Subject 3: 87

According to the given table, their CP points will be

Subject 1: 0.10

Subject 2: 3.01

Subject 3: 3.67

Assuming that all subjects are of equal 4CDH

Total CP = $0.10 \times 4 + 3.01 \times 4 + 3.67 \times 4 = 27.12$

Total credit hour = $4 \times \text{total subjects per semester} = 4 \times 3 \text{ (in above case)} = 12$

Semester GPA = total CP / Total credit hour

Note:

You are free to set CP and grade with respect to each marks for middle values but its value should be confined within the given upper and lower bound of the marks range

Distribution of marks is as follows: Total Marks (20)

- (2 marks) Correct entering of semester -
- (3 marks) Take input for marks of subjects in each semester
- (2 marks) Ensure correct entering of marks
- (4 marks) Display Grades with respect to each subject —
- (3 marks) Compute GPA of each semester —
- (2 marks) Rule for probation
- (2 marks) Rule for DI in first half (i.e. 4) of the semester —
- (2 marks) Rule for Repetition of semester for second half (i.e. after 4 up to 8) semester —