# CS-1002 Programming Fundamentals – Software Engineering

## Assignment – 01 – Total Marks 150

Due Date: September 18, 11:59 PM

**Instructions (Must Read)**

- This is an individual assignment
- You are required to write your solution in a pdf document & flowcharts must be designed in a proper diagram tool (draw.io). Please note that handwritten assignment is unacceptable. For questions which require coding, add your code along with output screen shots.
- All the questions must be done in sequence.
- If code is required, all coding will be done in C++ language. Code comments are mandatory.
- If the question is related to the conditions, you can use ternary operator for that.
- You are not allowed to topics that are not covered in the classroom such as Loops, Arrays, Pointers, etc.
- Any kind of Plagiarism either copying from your other fellows, over the internet, or generative AI will result in zero mark in whole Assignment Section.
- Make sure you define all the logics, pseudocodes and flowcharts should contain all the details. Solution should not have vague statements.
- Viva will be conducted for the submitted assignment. You will not be marked if you are unable to explain the code during demo.
- For timely completion of this assignment, start as soon as possible.
- Test Cases are given for your convenience. Your code will also test for more test cases.
- Write your name and roll no on the top of every .cpp file. Failure to do so will result in 20% deduction of marks.
- For submission, you need to combine all .cpp file into one zip folder and rename as SECTION_i24XXXX (like A_i240001). All code files must contain the correct question number as well.
- All late assignments will be marked zero.

**Question 1: - Important Message on Console** **10 Marks**

Write a C++ program to print the following string "Say No to Plagiarism" in console

**Question 2: - Reversal of numbers!!** **30 marks**

*Write pseudocode, make flow chart and then write C++ code for the following program.*

If a five-digit number (Integer) is input through the keyboard, write a program to reverse the number. The entered number will always be of 5 digits

Example Test Case:

User Enters – 12345

Output – 54321

**Question 3: - Give me my money!!** **30 marks**

*Write pseudocode, make flow chart and then write C++ code for the following program.*

A cashier has currency notes of denominations Rs 10, Rs 50 and Rs 100. If the amount to be withdrawn is inputted through the keyboard in hundreds and is always divisible by 10, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer. Just so you know, the cashier will always provide cash from higher dominations first.

Example Test Case:

Input of Withdraw amount = 160

Output: 1 hundred Rs notes, 1 fifty Rs notes, 1 ten Rs notes.

Example Test Case:

Input of Withdraw amount = 1020

Output: 10 hundred Rs notes, 0 fifty Rs notes, 2 ten Rs notes.

**Question 4: - Let's go Binary!!** **20 marks**

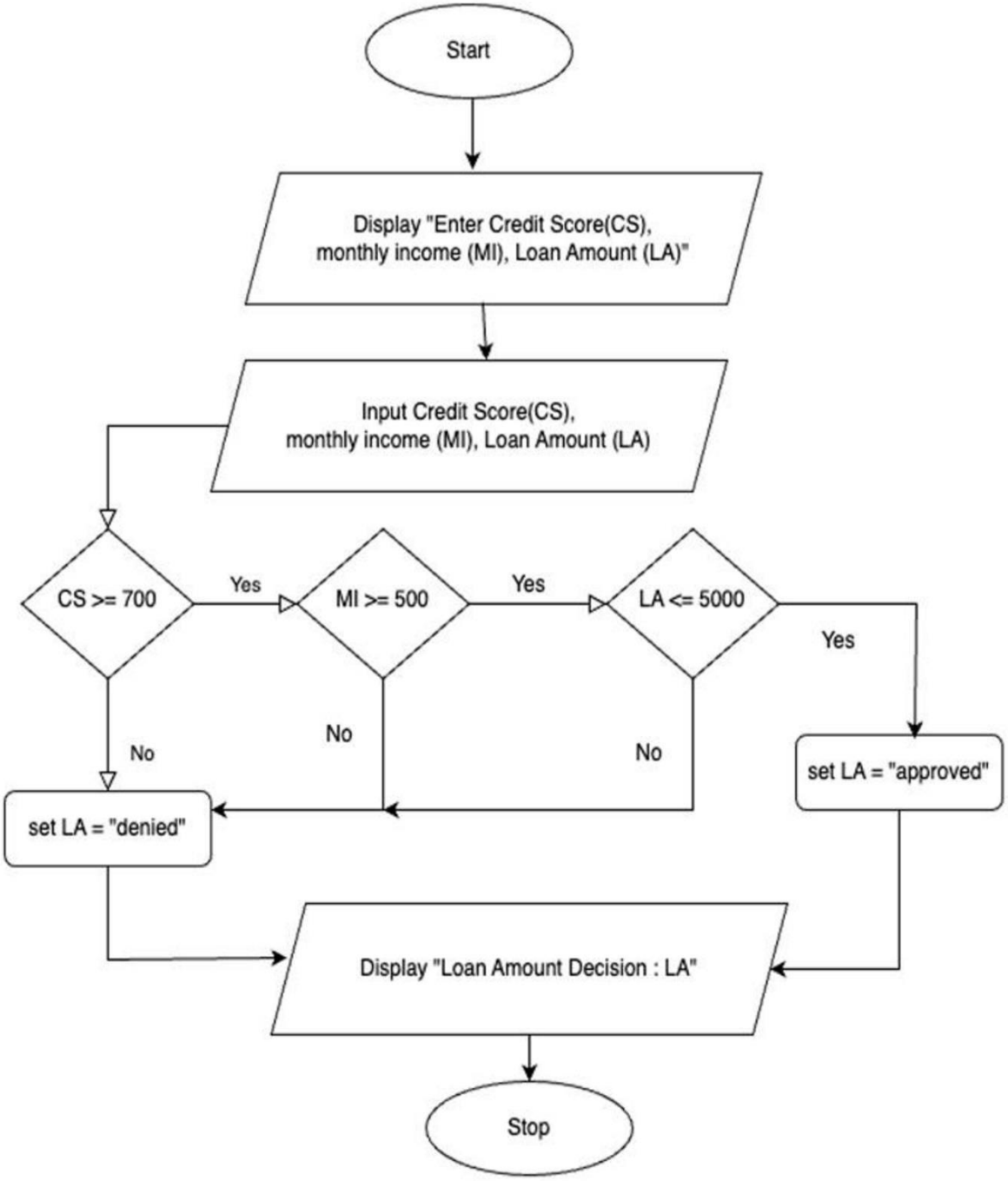
Write a pseudo code and flowchart for a program that takes a number in decimal number system as an input (e.g., 95) and displays its equivalent in binary (e.g., 95 → 01011111).

**Question 5: - Am I Prime?** **10 marks**

Write a pseudo code of a program that inputs a number from the user and checks whether the number is prime or not.

**Question 6: - Loan Approval Decision Process!!** **20 marks**

*Write a pseudocode of the following flow chart*



**Question 7: - What's my GPA?** **30 marks**

*Write pseudocode, make flow chart and then write C++ code for the following program.*

A GPA calculates the average of grade points of all the subjects of a course registered in a semester. You must create a program that calculates the GPA of a student. The student can register in a maximum of 5 subjects in a course, or less. The program should prompt the user to enter the marks of a students in each subject, and corresponding credit hours. Then based on that marks you can assign it grade letter, and then you can find the grade points.

| Marks Obtained | Grade Letters | Grade Points |
|---|---|---|
| ≥ 90 | A+ | 4.00 |
| 86-90 | A | 4.00 |
| 82-86 | A- | 3.67 |
| 78-82 | B+ | 3.33 |
| 74-78 | B | 3.00 |
| 70-74 | B- | 2.67 |
| 66-70 | C+ | 2.33 |
| 62-66 | C | 2.00 |
| 58-62 | C- | 1.67 |
| 54-58 | D+ | 1.33 |
| 50-54 | D | 1.00 |
| ≤49 | F | 0 |

Calculate the grade points of all the subjects and calculate GPA using the following formula:

$$GPA = \frac{\sum (Course\ GP * Course\ Credits)}{\sum Gradable\ Credits}$$

Display the calculated GPA. Additionally,

- If the student has 4.00 CGPA, display a congratulation message to stating that your name is placed in Rector List of Honor.
- If the student has CGPA > 3.50, display a congratulation message to stating that your name is placed in Dean's List of Honor.
- If the student has CGPA < 2.00, display a message to stating your name is placed in Warning List.