CS-1002 Programming Fundamentals Spring - 2023

[Assignment – 01] **[Total Marks 60]**

Question 1:

Draw the flowchart for a program that accepts an unknown number of ages from the keyboard until zero is entered. If the age is greater than or equal to 100 output "You have lived a century" otherwise if age is greater than or equal to 55 output "AARP here I come" otherwise output "You are still a spring chicken."

Question 1 Submission Format:

You have to draw the flow chart on Microsoft Visio and submit the Question1_Rollnumber.vsdx file.
For example (Question1_22I-1234.vsdx)

Question 2:

Draw the flowchart for the following pseudocode.

```
START

Set turnCount to 0
Set win to false

REPEAT
   Roll dice 1
   Roll dice 2
   Add 1 to turnCount

   IF (dice 1 equals 6) OR (dice 2 equals 6) THEN
      Display "You rolled a 6! Take another turn."
   ELSE
      EXIT loop
   END IF

UNTIL win is true OR turnCount is greater than 7

IF turnCount is greater than 7 THEN
   Set win to true
END IF

IF win is true THEN
   Display "Congratulations! You win in " + turnCount + " turns."
ELSE
   Display "Sorry, you lose."
END IF

STOP
```

Question 2 Submission Format:

You have to draw the flow chart on Microsoft Visio and submit the Question2_Rollnumber.vsdx file.
For example (Question2_22I-1234.vsdx)

Question 3:
Draw the flowchart for the following pseudocode

```
START

Set total to 0
Ask the user to enter an integer
Get the integer from the user

WHILE the integer is not equal to 0
   Add the integer to the total
   Display the running total
   Ask the user to enter another integer
   Get the integer from the user
END WHILE

Display the final total

STOP
```

Question 3 Submission Format:
You have to draw the flow chart on Microsoft Visio and submit the Question3_Rollnumber.vsdx file.
For example (Question3_22I-1234.vsdx)

Question 4:
Draw the flowchart for the following pseudocode

1. Read hourly pay rate from user and assign it to the variable "hourly_rate"
2. Read number of hours worked from user and assign it to the variable "hours_worked"
3. Initialize "regular_pay" and "overtime_pay" to 0
4. If "hours_worked" is less than or equal to 40, set "regular_pay" to "hours_worked" multiplied by "hourly_rate"
5. If "hours_worked" is greater than 40, calculate the regular pay and overtime pay separately:
   a. Set "regular_pay" to 40 multiplied by "hourly_rate"
   b. Set "overtime_pay" to ("hours_worked" - 40) multiplied by "hourly_rate" multiplied by 1.5
6. Add "regular_pay" and "overtime_pay" to get "gross_pay"
7. Output "gross_pay"

Question 4 Submission Format:
You have to draw the flow chart on Microsoft Visio and submit the Question4_Rollnumber.vsdx file.
For example (Question4_22I-1234.vsdx)

Question 5:
Draw the flowchart for the following pseudocode

1. Initialize variables for even count, odd count, even sum, odd sum, and input number.
2. Set the values of even count, odd count, even sum, and odd sum to 0.
3. For i from 1 to 20, do the following:
   a. Read the input number.
   b. If the input number is even, add it to the even sum and increment the even count.
   c. If the input number is odd, add it to the odd sum and increment the odd count.
4. Calculate the average of even numbers by dividing the even sum by the even count. Print the count and average of even numbers.
5. Calculate the average of odd numbers by dividing the odd sum by the odd count. Print the count and average of odd numbers.

Question 5 Submission Format:
You have to draw the flow chart on Microsoft Visio and submit the Question5_Rollnumber.vsdx file.
For example (Question5_22I-1234.vsdx)

Example solution for question 6 to 10
Example Question: Solve the expression: ((8 - 3) * 5 / 2 + 7 > 20) && true || false
Solution:
((8 - 3) * 5 / 2 + 7 > 20) && true || false
= ((5 * 5 / 2 + 7 > 20) && true) || false
= ((25 / 2 + 7 > 20) && true) || false
= ((12.5 + 7 > 20) && true) || false
= (19.5 > 20 && true) || false
= (false || false)
= false

Question 6:
Solve the expression step by step.

Expression: ((5 + 3) * 2 - 7) / (8 % 3) > 1 && (true || false) && !(5 == 6)

Question 6 Submission Format:
You have to solve it on paper and write your name, roll number, and question number on top of that paper and then take a picture of that solution and submit that picture (format of picture must be jpeg or png. (Picture must be readable, zero marks if there is a single ambiguity in reading the picture). Question6_Rollnumber.jpeg file.
For example (Question6_22I-1234.png or Question6_22I-1234.jpeg)

Question 7:
Solve the expression step by step.

((3 + 4 * 2) - 6 / 3) % 5 == 1 && (true || false) && !(6 <= 5)

Question 7 Submission Format:
You have to solve it on paper and write your name, roll number, and question number on top of that paper and then take a picture of that solution and submit that picture (format of picture must be jpeg or png. (Picture must be readable, zero marks if there is a single ambiguity in reading the picture). Question7_Rollnumber.jpeg file. For example (Question7_22I-1234.png or Question7_22I-1234.jpeg)

Question 8:
Solve the expression step by step.

9 / 2 * 7 + 10 % 3 < 27 || (false && true)

Question 8 Submission Format:
You have to solve it on paper and write your name, roll number, and question number on top of that paper and then take a picture of that solution and submit that picture (format of picture must be jpeg or png. (Picture must be readable, zero marks if there is a single ambiguity in reading the picture). Question8_Rollnumber.jpeg file. For example (Question8_22I-1234.png or Question8_22I-1234.jpeg)

Question 9:
Solve the expression step by step.

(2 + 5 * 3 - 7) >= 8 || (true && false) && !(3 > 5)

Question 9 Submission Format:
You have to solve it on paper and write your name, roll number, and question number on top of that paper and then take a picture of that solution and submit that picture (format of picture must be jpeg or png. (Picture must be readable, zero marks if there is a single ambiguity in reading the picture). Question9_Rollnumber.jpeg file. For example (Question9_22I-1234.png or Question9_22I-1234.jpeg)

Question 10:
Solve the expression step by step.

(8 * 2 + 5) % 3 != 0 || (false && true) && (4 > 2)

Question 10 Submission Format:
You have to solve it on paper and write your name, roll number, and question number on top of that paper and then take a picture of that solution and submit that picture (format of picture must be jpeg or png. (Picture must be readable, zero marks if there is a single ambiguity in reading the picture). Question10_Rollnumber.jpeg file. For example (Question10_22I-1234.png or Question10_22I-1234.jpeg)

Question 11:
Write a C++ program that outputs the following smiley pattern using I/O manipulator <iomanip> appropriately. In the start of the program print your name, roll number, degree name, and Smile its Sunnah. (Note: You cannot use any string literals containing white spaces in couts.)

For example:

Hye. I am Mr./Miss (Name)
My roll number is (Your roll number like: 22I-1234)
My Degree is (Your Degree Like: BS(AI), BS(DS)..)

Smile its Sunnah:

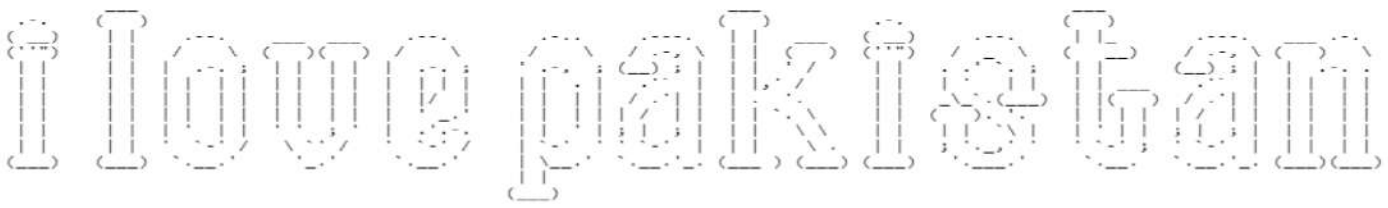
Question 11 Submission Format:
You have to solve it on Microsoft Visual Studio. Write your name, roll number, and question number on top of the program using proper comments. Submit only .cpp file of your program. Question11_Rollnumber.cpp file. For example (Question11_22I-1234.cpp)

Question 12:
Write a C++ program that outputs the I LOVE PAKISTAN in pattern like below using I/O manipulator <iomanip> appropriately. In the start of the program print your name, roll number, degree name, and I love Pakistan. (Note: You cannot use any string literals containing white spaces in couts.)

For example:

Hye. I am Mr./Miss (Name)
My roll number is (Your roll number like: 22I-1234)
My Degree is (Your Degree Like: BS(AI), BS(DS))

I love Pakistan:



Question 12 Submission Format:
You have to solve it on Microsoft Visual Studio. Write your name, roll number, and question number on top of the program using proper comments. Submit only .cpp file of your program. Question12_Rollnumber.cpp file. For example (Question12_22I-1234.cpp)

Question 13:

- **Instructions.**
- Combine all your work in one folder. The folder must contain only the files as instructed in each questions separately.
- Rename the folder as ROLL-NUM_SECTION_NAME (e.g. 22i-1234_A_Ali) and compress the folder as a zip file. (e.g. 22i-1234_A_Ali.zip).
- Do not submit .rar file.
- Submit the .zip file on Google Classroom within the deadline.
- Submission other than Google classroom (e.g. Email etc.) Will not be accepted.
- The student is solely responsible to check the final zip files for issues like corrupt file, virus in the file, mistakenly exe sent.
- If instructor cannot download the file from Google classroom due to any reason it will lead to zero marks in the assignment.
- Deadline to submit assignment is **23rd February 2023 11:59 PM.**
- Assignment submitted after the deadline will be marked DIRECT ZERO.
- You are supposed to submit your assignment on GOOGLE CLASSROOM (CLASSROOM TAB only, not lab).
- Correct and timely submission of the assignment is the responsibility of every student; hence no relaxation will be given to anyone.
- For timely completion of the assignment, start as early as possible.
- Plagiarism is not allowed. If found plagiarized, you will be awarded zero marks in all the assignments.