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**Lab Instructor: Abdul Qadeer Bilal**

**Section: BCS 3A, 3B, 3C**

**Semester: Fall 2022**

Roll Number: \_\_\_\_\_\_\_\_\_\_\_

Section: \_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Note: Program all Questions on AFD and Put code + Screenshot in the Word File till end of Lab. Any kind of Plagiarism will be awarded straight zero marks**

**Q1** Write a program which will ask the user to enter his/her marks (out of 100). Define a subroutine that will display grades according to the marks entered as below:  
Marks        Grade  
91-100         AA  
81-90          AB  
71-80          BB  
61-70          BC  
51-60          CD  
41-50          DD  
<=40          Fail

**Q2:** Write a subroutine to print the factorial of a number by defining a subroutine named 'Factorial'.  
Factorial of any number n is represented by n! and is equal to 1\*2\*3\*.... \*(n-1) \*n. E.g.-  
4! = 1\*2\*3\*4 = 24  
3! = 3\*2\*1 = 6  
2! = 2\*1 = 2

**Q3:** Implement the following two subroutines in your program. Assign proper values to registers and variables to form the Boolean expression true or false. Call these subroutines in your main function. Assign the subroutine name according to your will

(a): First subroutine:

**if bx > cx then**

**X = 1**

(b): Second subroutine

**if dx = cx then**

**X = 1**

**else**

**X = 2**

**Q4:** **Write a two-subroutine program**, first subroutine program that takes 30 numbers in an array, adds all the numbers and store in a variable and return it. Then the second subroutine program should allow you to split the array in two parts **15,15 numbers in two arrays after that subtracts sum of the two arrays a**nd finally return this number and add this sum with the sum of the 30 number array get from the previous subroutine in the main program.

**Make the answer as appropriate as discussed so full marks will be awarded and be sure to add comments for better understanding**