National University of Computer & Emerging Sciences

Lab # 3

For

Programming Fundamentals - Lab

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FAST School of Computing

Instructions:

1. Attempt all your questions on a paper, once done scan it with your cell phone and upload the PDF to the portal at Google Classroom.
2. Plagiarism is strictly prohibited.
3. Late submissions are not allowed.
4. This is a pair-programming task, only one person is to submit the solutions.
5. Write your roll numbers, lab#, section and date on the top right corner of the page.
6. You are encouraged to discuss the problem and potential solutions with your partner.
7. Write the inputs and outputs of the program before beginning the pseudocode.

Scenarios:

For all the scenarios given below you are to think of solutions and write them down in the form of a pseudocode. Please follow the syntax taught in the class.

Important: For all problems write down the inputs and outputs of the pseudocode before you start writing down the pseudocode, along with the purpose.

Question#1

Write a pseudocode to display the first 3 natural numbers.

Question#2

Write a pseudocode to display the first 300 natural numbers.

Question#3

Write a pseudocode to display the first 5 even numbers.

Question#4

Write a pseudocode to display the first 500 odd numbers.

Question#5

Write a pseudocode to display the first ‘n’ even numbers, where ‘n’ is a positive integer given by the user.

Question#6

Write a pseudocode to display the ‘n’ even numbers **after** the number ‘start’, where ‘n’ and ‘start’ are positive integers given by the user.

For example: if the user enters n=5, start=21

Output: 22, 24, 26, 28, 30 (the next 5 even numbers **after** the number 21)

Question#7

Write a program that prompts the user for a starting and ending number, then prints all the numbers in that range.

Question#8

Create a program that calculates the sum of all the numbers from 1 to a given positive integer n and then print it on the screen.

Question#9

Write a program that takes an integer n and prints the multiplication table up to 10 for that number.

Question#10

Implement a program that computes the factorial of a given positive integer n.

Question#11

Write a program that calculates the result of raising a number base to an exponent exp.

Question#12

Create a program that calculates the sum of the squares of all the numbers from 1 to n.

Note: Use of logical operators (AND, OR) is not allowed in the following questions.

Question#13

Write a program that takes coordinates (x, y) as input and determines which quadrant they lie in.

Question#14

Implement a program that takes three numbers as input and prints them in ascending order.

Question#15

Create a program that takes the lengths of three sides of a triangle and determines whether it's equilateral, isosceles, or scalene.

Question#16

Implement a program that simulates a traffic light. It should prompt the user for the current color and then display the next color.

Question#17

Write a program that counts and prints the number of digits in a positive integer that will be given as an input by the user.

Question#18

Write a program that takes an integers n and m and prints the multiplication table of ‘n’ up to ‘m’ for that number.

Note: for this question you cannot use multiplication * in any statement.

Question#19

Write a pseudocode to check if a give number is a prime number or not.