Problem Sets for Loops and Conditional statements

Date: 09/04/2025 (Day2)

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Q1: Take an integer number as user input and then check whether it is odd or even. Task: Check with following numbers (9, 18, -5, 0).

Q2: Create a matrix of 1s of size (8,8). Assign new values to each element as follows: Assign 0 on the main diagonal, 2 on the adjacent diagonals, and 1 everywhere else.

Q3: Write a MATLAB program to get the Fibonacci series between 0 to 50.

Q4: Write a MATLAB program to find all the prime numbers between 0 to 100.

Q5: Write a MATLAB program that acts as a basic calculator. The program should allow the user to input two numbers and select an operation (addition, subtraction, multiplication, division). Based on the selected operation, use a switch case to perform the calculation and display the result.

Q6: Write a MATLAB program to calculate and display the squares of the first 10 positive integers.

Q7: Write a MATLAB program to display the multiplication table for a number entered by the user, up to 10.

Q8: Write a MATLAB program to calculate and display the factorial of a number entered by the user.

Q9: Write a MATLAB program to calculate the cumulative sum of an array of numbers. The program should follow following instructions:

- ✓ Take an input array from the user.
- ✓ Compute the cumulative sum using a for loop and store it in a new array.
- ✓ Display the original array and the cumulative sum array.

Q10: Write a MATLAB program to generate the Fibonacci sequence up to a user-defined number of terms. Store the sequence in an array and display the result.

Q11: Write a MATLAB program to generate an array containing the cubes of the first 10 positive integers.

Q12: Write a MATLAB program to generate an array of even numbers starting from 2, until the sum of the array exceeds 50.

Q13: Write a MATLAB program to find and display the sum of all positive integers less than a user-defined number using a while loop.

Q14: Write a MATLAB program to calculate the reverse of a given positive integer using a while loop. For example, if the input is 1234, the output should be 4321.

Q15: Write a MATLAB program that:

- ✓ Creates a random matrix of integers between 1 and 20.
- ✓ Uses a while loop to repeatedly double the values in the matrix until the maximum element in the matrix exceeds 100.
- ✓ Displays the matrix at each step of the iteration.

Q16: Write a MATLAB program to iteratively normalize the rows of a matrix until all row sums are less than or equal to 1. The program should:

- ✓ Generate a random matrix of integers between 10 and 50.
- ✓ Normalize each row by dividing its elements by the row sum.
- ✓ Continue the normalization process using a while loop until all row sums are ≤ 1.

Q17: Write a MATLAB program to solve a quadratic equation and handle the three different cases for the roots based on the discriminant

Q18: Write a MATLAB program to simulate the scenario where a random array represents monthly expenses for 500 customers. The program identifies and sorts the customers whose expenses exceed a given threshold, making them eligible for a credit card application.

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