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CSE117 Problem Solving with C

Handout - Lab Session - 5

Nested Loops

Objective:

- To write C programs using do…while and for statements.
- To write C programs using nested loops

Pre-Lab: Go through the concepts of do…while and nested loops. Write the algorithm and flowcharts for all the exercise problems given in this handout.

During Lab: Solve all the exercise problems. You should work on the additional set of programs only after completing this week's tasks.

Post Lab: Take the quiz.

Lab Exercises

Design algorithm, flow chart, and program using the data requirements given for the exercise problems and try all the test cases.

Exercise 1: **Sequence Generator**

Read the first term and last term in the sequence from the user at the keyboard. Use for loops to print the following sequences.

a. 6,8,10,12,.....48
b. 5,7,9,11,.....45
c. The first 50 numbers in the series 1,6,11,16,....., and calculate the sum of these terms.

Exercise 2: **Sum of Series (do…while)**

Given a positive integer, n, use a do…while loop to read n integers from the user at the keyboard and print their sum.

Sample Test Cases	Input	Output
Test Case 1	n = 6 0 1 1 2 3 5	sum: 12
Test Case 2	n = -6	Invalid input. Try again.

Exercise 3: **Pattern Generator**

Create the following patterns

******** ******* ***** *** *	1 * * * * 1 2 * * * 1 2 3 * * 1 2 3 4 * 1 2 3 4 5	1 1 2 1 1 2 3 2 1 1 2 3 4 3 2 1 1 2 3 4 5 4 3 2 1	1 2 1 3 2 1 4 3 2 1 5 4 3 2 1	1 1 2 1 1 2 3 2 1 1 2 3 4 3 2 1 1 2 3 4 5 4 3 2 1

Exercise 4: **Largest Number**

Read 'n' integers from the user at the keyboard. Print the largest value entered and the number of times it was entered.

Sample Test Cases	Input	Output
Test Case 1	Enter the count of numbers,n: 10 Enter 1th number: 4 Enter 2th number: 12 Enter 3th number: 6 Enter 4th number: 9 Enter 5th number: 12 Enter 6th number: 8 Enter 7th number: 7 Enter 8th number: 11 Enter 9th number: 1 Enter 10th number: 5	largest number - 12 count - 2
Test Case 2	Enter the count of numbers,n: -10	Invalid Count. Please try again.

Exercise 5: **Euler's number**

Read a non-negative integer, n, from the user and print Euler's number e which is approximated as follows.

$$E = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \frac{1}{5!} + \ldots\ldots\ldots + \frac{1}{(n-1)!} + \frac{1}{n!}$$

1!Sample Test Cases	Input	Output
Test Case 1	5	120
Test Case 2	20	2432902008176640000
Test Case 3	-3	Invalid input.