



Lab 3: Loop statements

Exercise 1:

Write a C program that displays the square of all the numbers less than N. N is a positive integer entered by the user. Provide versions with the three types of loops FOR, WHILE, and DO-WHILE.

Exercise 2:

Write a program that asks the user to enter a positive integer that must be a multiple of 3 and greater than 50. The request for input will be repeated until the response is satisfactory.

Exercise 3:

Write a C program that asks the user to enter two integer numbers, A and B. Then, it asks the user to enter a real number X whose square is between A and B. The program must continue to ask for the input of X until the user enters a correct number. If the number entered is not correct, the program must also indicate to the user whether to enter a larger or smaller number.

Example of the output :

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Enter two integer numbers: : 320 160
Enter a real number whose square is between 160 and 320 : 11.6
The number is not valid. The number should be larger: 25
The number is not valid. The number should be smaller: 15
Perfect, The square of 15.00 is between 160 and 320 !
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The italicized numbers are the values entered by the user.

Exercise 4:

Write a C program that asks the user to enter a set of non-zero real numbers. The input will end if the number entered is equal to 0, or if the product of the numbers entered is greater than the cube of their sum. At the end, the program must display the sum and the product of the numbers entered. Provide another version with an infinite loop and the **break** statement.

Exercise 5:

Write a C program that asks the user to enter an integer N and displays the smallest integer n such that the sum of all the inverses of the numbers less than n is greater than N. (search n such as

$$\sum_{i=0}^n \frac{1}{i} \geq N)$$

Exercise 6 :

Write a program that asks the user to enter an integer and displays the number of digits in that number, then displays it in reverse.

For example: if the user enters 123456, the program displays the following message:

The number 123456 contains 6 digits. Its reverse is: 654321.