
Worksheet 2 « Control Structures »

Exercise 1

Write a program that asks the user to type an integer and displays WIN if the integer is between 55 and 85 bounds inclusive, LOST otherwise.

Exercise 2

Write a C++ program to input angles of a triangle and check whether the triangle is valid or not.

Exercise 3

Write a program to find all the roots of a quadratic equation.

Exercise 4

Write a C++ program that determines a student's grade. The program will read three types of scores (quiz, mid-term, and final scores) and determine the grade based on the following rules:

| | |
|---|-----------|
| -if the average score $\geq 90\%$ | : grade=A |
| -if the average score $\geq 70\%$ and $<90\%$ | : grade=B |
| -if the average score $\geq 50\%$ and $<70\%$ | : grade=C |
| -if the average score $< 50\%$ | : grade=F |

Exercise 5

Write a program that displays all integers from 8 to 23 (bounds included) using FOR loop then WHILE loop.

Exercise 6

Write a program to read 10 integers and displays their sum.

Exercise 7

Write a program that asks the user to type an integer N and calculates the sum of the cubes from 5^3 to N^3 .

Exercise 8

Write a program (for each case) that asks the user to enter an integer n and calculates u(n) defined by:

| (1) | (2) | (3) |
|-------------------------------|--|--|
| $u(0)=3$ $u(n+1)=3*u(n)+4$ | $u(0)=1$ $u(1)=1$ $u(n+1)=u(n)+u(n-1)$ | $u(0)=3$ $u(1)=2$ $u(n)=n.u(n-1)+(n+1).u(n-2)+n$ |

Exercise 9

Write a program that asks the user to input an integer N between 0 and 20 bounds inclusive and displays N+17. If you type an erroneous value, you must display "error" and ask to enter the integer again.

Exercise 10

Write a program that asks the user to type strictly positive integers and displays their mean. When you type a negative value, the program displays ERROR and asks you to retype a value. Typing 0 means the last integer was typed. The average is then displayed. If the number of integers typed is equal to 0, NO AVERAGE is displayed.

Exercise 11

Write a program that allows you to perform operations on an integer (initial value at 0). The program displays the value of the integer then displays the following menu:

1. Add 1
2. Multiply by 2
3. Subtract 4
4. Exit

The program then asks to type an integer between 1 and 4. If the user types a value between 1 and 3, the operation is carried out, the new value of the integer is displayed, then the menu is displayed again and so on until you type 4. When you type 4, the program ends.

Exercise 12

Write a program that calculates the power of two numbers using loops.

Exercise 13

Write a program that asks to enter 10 integers and displays the number of occurrences of the highest number.

Exercise 14

Write a program to reverse the digits of a given integer.

Exercise 15

Write a program to calculate the sum of the N odd natural numbers.

Exercise 16

Write a program to find HCF (Highest Common Factor) of two numbers

Exercise 17

Write a program to check whether a given number is a perfect number or not.

Exercise 18

Write a program to print a hollow square or rectangle star pattern.

Exercise 19

Write a program that asks to enter an integer N and displays N!

Exercise 20

- a)- Write a program that asks to enter an integer and indicates if this integer is prime or not.
- b)- Write a program that asks the user to enter an integer N and displays the number of prime numbers less than or equal to N.