**HOMEWORK 7: CS 102 – section 1**

**Due Date: Thursday, 10/17/2024**

1. Predict the outputs from the following program segments:
2. int num = 1;

while (num \* num <= 50)

{

cout << num << “, “ ;

num += 2;

}

Output: 1, 3, 5, 7,

1. int count = 10;

int sum = 0 ;

while (count >= 1)

{

sum += count ;

cout << count << “ “ << sum << endl;

count--;

}

Output:

10 10

9 19

8 27

7 34

6 40

5 45

4 49

3 52

2 54

1 55

1. int x = 2187 ;

int i;

int y = 0;

for (i = x; i >= 1; i = i/3)

{

y++;

cout << “i = “ << i << “ y = “ << y << endl;

}

cout << “i = “ << i << endl;

Output:

i = 2187 y = 1

i = 729 y = 2

i = 243 y = 3

i = 81 y = 4

i = 27 y = 5

i = 9 y = 6

i = 3 y = 7

i = 1 y = 8

i = 0

1. How many times each of the following loops execute? What is the output in each case?
2. x = 5; y = 50; (assume both x and y are integers)

do

x = x + 10;

while (x < y);

cout << “x = “ << x << “ y = “ << y << endl;

Ans: The loop execute 5 times.

The output in each case is:

x = 5 + 10 = 15

x = 15 + 10 = 25

x = 25 + 10 = 35

x = 35 + 10 = 45

x = 45 + 10 = 55

1. x = 5; y = 80;

do

x = x \* 2;

while (x < y);

cout << x << “ “ << y << endl;

Ans: The loop execute 4 times.

The output in each case is:

x = 5 \* 2 = 10

x = 10 \* 2 = 20

x = 20 \* 2 = 40

x = 40 \* 2 = 80

1. x = 5; y = 30;

while (x > y)

x = x + 2;

cout << x << “ “ << y << endl;

output: 5 30

while(x>y) it check the condition and 5>30 is False so answer same 5 30 it doesn’t change.

1. int M = 10;

int I;

for (I = 1; I <= M ; I++)

{

cout <<setw(5) << M \* (I -1) ;

}

Output= 0 10 20 30 40 50 60 70 80 90

The loop executes 10 times in total.

1. Write a program that uses while loops to perform the following steps.
2. Prompt the user to input two integers: firstNum and secondNum (firstNum should be less than secondNum)
3. Output all the odd numbers between firstNum and secondNum
4. Output the sum of all even numbers between firstNum and secondNum
5. Output the numbers and their squares between 1 and 10
6. Output the sum of squares of all the odd numbers from firstNum and secondNum
7. Fibonacci series is numbers like 1, 1, 2, 3, 5, 8, 13, 21, etc.

The property of this series is starting from third number, any number is obtained by adding the two previous numbers.

Get an user input for a limit X (an integer), which is a positive integer.

Now design a while loop to display all the Fibonacci numbers up to X, Write the program

1. Write a program that can compute the average and standard deviations of N numbers (N is user input). In order to do this use the following steps.
2. Get user input for N
3. Set sum (floating-point variable) to 0, set sumOfSquare (also floating-point variable) to 0.0
4. Generate a loop (any kind of loop) using a count variables that starts from 1 and increases by 1 after each time, and maximum value of I is N.
5. Within the loop, get user input for a number (assume the number is a float)
6. Then compute sum as sum = sum + number
7. Compute sumofSquare = sumOfSquare + number2
8. Outside the loop compute average = sum/N
9. Compute variance = (sumOfSquare – N \* average2)/(N-1)
10. Compute standardDeviation = square root of variance.

Print out, the following with proper ttile

Sum

SumOfSquare

Average

Variance

Standard Deviation