Control Structure (While Loop)

6

WEEK

KEYWORDS:

While condition

LAB EXERCISE:

Program 1:

Type the following program in the editor of the C++ environment. Compile the program and run it.

```
#include<iostream>

using namespace std;

int main()
{
	int a=1;
	while(a <= 10)
	{
		cout << a << endl;
		a++;
	}

	cout << endl;
	system("PAUSE");
	return 0;
}
```

Output:

```
1
2
3
4
5
6
7
8
9
10
```

Program 2:

Type the following program in the editor of the C++ environment. Compile the program and run it.

```
#include<iostream>

using namespace std;

int main()
{
	int number;                    //variable to store the number
	int sum = 0;                   //variable to store the sum
	int count = 0;                 //variable to store the total

	cout  <<"Line 1: Enter integers greater than 0 "<<  endl;
	cin  >>  number;

	while (number > 0)
	{
		sum = sum + number;
		count++;
		cin  >>  number;
	}

	cout  <<"Line 7: The sum of the "<<  count  <<" numbers is"<< sum <<
	endl;

	if (count != 0)
		cout  <<"Line 9: The average is "<<  sum / count  <<  endl;
	else
		cout  <<"Line 11: No input."<<  endl;

	cout << endl;
	system("PAUSE");
	return 0;
}
```

Output:

```
Line 1: Enter integers greater than 0
1
2
3
4
0
Line 7: The sum of the 4 numbers is10
Line 9: The average is 2
```

ASSIGNMENT:

Question 1: What is the output of the following program?

```
#include <iostream>
using namespace std;

int main()
{
    int x, y, z;
    x = 4; y = 5;
    z = y + 6;
    while(((z - x) % 4) != 0)
    {
            cout  <<  z  <<  " ";
            z = z + 7;
    }
    cout  <<  endl;
    return 0;
}
```

Output:

11 18 25

Question 2: Suppose that the input is:

58 23 46 75 98 150 12 176 145 -999

What is the output of the following program?

```
#include <iostream>
using namespace std;
int main()
{
    int num;
    cin  >>  num;
    while (num != -999)
    {
            cout  <<  num % 25  <<  " ";
            cin  >>  num;
    }
    cout  <<  endl;
    return 0;
}
```

Output:

```
8
23
21
0
23
0
12
1
20
```

Question 3: With the help of for, while loop generate the following series

a. Natural numbers from 1 to 100
b. Even numbers between 1 and 50.

while loop: Print 1 to 100

```
int main() {
  int num = 1;

  while (num <= 100) {
    cout << num << endl;
    num++;
  }

  return 0;
}
```

while loop: Print even numbers between 1 to 50

```
#include <iostream>

using namespace std;

int main() {
  int num = 1;

  while (num <= 50) {
    if (num % 2 == 0) {
        cout << num << endl;
      }
    num++;
  }

  return 0;
}
```

Question 4: Write a program that will calculate the sum of first 100 natural numbers?

Input and Output:

```
Sum is : 5050
```

Constants and Variables:

```
int sum , num
```

Flowchart:

Code:

```
#include <iostream>

using namespace std;

int main() {

 int num =1 ,sum = 0;

 while(num <= 100){
        sum =sum + num;
        num++;

 }

 cout << "The sum is: " << sum << endl;

 return 0;
}
```

Question 5: Write a program to print the square and the cube of a series of numbers (1,2,3 ..5), but it displays the output in a table of three columns. The first column presents the numbers; the second column presents the square of the numbers while the third column presents the cubic of the same number.

Input and Output:

```
Number    Square    Cube
1           1         1
2           4         8
3           9         27
4           16        64
5           25        125
```

Constants and Variables:

```
int  num ,  square , cube
```

Flowchart:

Code:

```
#include <iostream>

using namespace std;

int main() {
  int num=1;
  int square;
  int cube;

  cout << "Number   Square  Cube" << endl;

          while(num <= 5){
                  square = num * num;
          cube = num * num * num;

          cout << num << "        " << square << "       " << cube << endl;

                    num++;

           }

  return 0;
}
```