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WORKSHEET 20

School: Ba Sangam College
Subject: Computer Studies

Year / Level: 13
Name of Student: _____

STRAND	CE 13.3 APPLICATION PACKAGES
SUB STRAND	CE 13.3.2 PROGRAMMING
CONTENT LEARNING OUTCOME	CE 13.3.1.2 ANALYZE AND CONSTRUCT PROGRAMS USING PROGRAMMING SKILLS LEARNT FROM C++

Repetition statements

- The real power of the program is realized when the same type of statements can be executed over and over again.
- The repetition statements both define the boundary of the program containing the repeated section of the program and controls whether the code should be executed or not.
- In general there are two forms of repetition statements:
 - While
 - For

While Loops

- In C++ while loop is constructed using a **while** statement
- The syntax of the statement is as follows:
while (expression)
statement
- The expression contained within the parenthesis is the condition tested to determine if the statement following the parenthesis is to be executed.
- In the while statement the expression is executed repeatedly until the condition holds true.

Example 1

This program enables a user to enter English and Maths marks. The program will calculate and display the average mark. This program will run for 3 students.

```
#include <iostream>
```

```
#include <stdlib.h>
using namespace std;
int main ()
{
int E,M,count,A;
count=0;
while (count<3)
{
cout<<"enter english mark"<<endl;
cin>>E;

cout<<"enter maths mark"<<endl;
cin>>M;
A=(E+M)/2;
cout<<"Average is"<<A<<endl;
count=count+1;
}
system("pause");
return (0);
}
```

The output of the above program is shown below.

```
enter english mark
90
enter maths mark
80
Average is85
enter english mark
70
enter maths mark
60
Average is65
enter english mark
50
enter maths mark
40
Average is45
Press any key to continue . . .
```

Example 2

This program displays all even numbers from 2 to 20.

```
#include <iostream>
#include <stdlib.h>
using namespace std;
```

```
int main ()
{
    int count;
    count=2;
    while (count<=20)
    {
        cout<<count<<endl;
        count=count+2;
    }
    system("pause");
    return (0);
}
```

The output produced by the above program is shown below.

```
2
4
6
8
10
12
14
16
18
20
Press any key to continue . . .
```

Example 3

The program given below asks the user to answer a question. The relevant statements will be repeated until the user types in the right answer.

```
#include <iostream>
#include <stdlib.h>
using namespace std;

int main ()
{
    int answer;
    while (answer !=15)
    {
        cout<<"What is the answer of the following 5 + 5 X 2" <<endl;
        cin>>answer;
    }
    system("pause");
    return (0);
}
```

Given below is the output produced by the above program.

```
What is the answer of the following 5 + 5 X 2
10
What is the answer of the following 5 + 5 X 2
12
What is the answer of the following 5 + 5 X 2
16
What is the answer of the following 5 + 5 X 2
18
What is the answer of the following 5 + 5 X 2
15
Press any key to continue . . .
```

In the example given so far we have used the **while** loop. Now we will look at the **for** loop.

For Loops

- In C++ for loop is constructed using for statement. The statement performs the similar function as while loop but uses different statement.
- For Loop is preferable in situations which uses a fixed count.
- The syntax of for loop is given as follows:
- **for(counter initialization; expression; counter alteration)
Statement;**

EXAMPLE 4

The following program does exactly the same thing as Example 1 but uses FOR loop.

```
#include <iostream>
#include <stdlib.h>
using namespace std;
int main()
{
float eng, maths, average;
for (int i = 1; i < 5; i++)
{
cout<<"enter english mark"<<endl;
cin>>eng;
cout<<"enter maths mark"<<endl;
cin>>maths;
average=(eng+maths)/2;
cout<<"average= "<<average<< endl;
}
system("PAUSE");
return 0;
}
```

Shown below is the output of the above program.

```
enter english mark
90
enter maths mark
80
average= 85
enter english mark
70
enter maths mark
80
average= 75
enter english mark
60
enter maths mark
60
average= 60
Press any key to continue . . .
```

EXAMPLE 5

The following program does exactly the same thing as Example 2 but uses FOR loop.

```
#include <iostream>
#include <stdlib.h>
using namespace std;
int main()
{
int num;
for (num = 2; num <= 20; num += 2)
{
cout<<num<<endl;
}
system("PAUSE");
return 0;
}
```

Output produced by the above program is as follows.

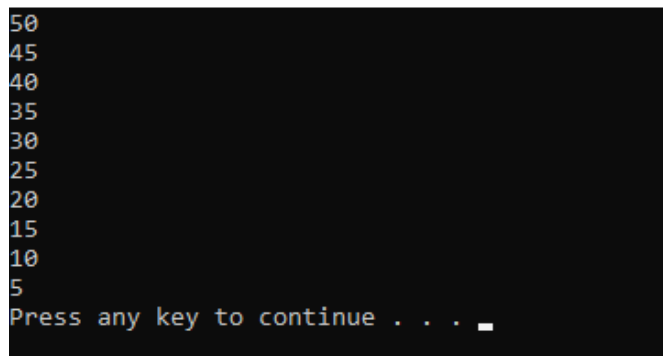
```
2
4
6
8
10
12
14
16
18
20
Press any key to continue . . .
```

Example 6

The program given below displays all multiples of 5 from 50 down to 5.

```
#include <iostream>
#include <stdlib.h>
using namespace std;
int main()
{
int num;
for(num = 50; num >=5; num-=5)
{
cout<<num<<endl;
}
system("PAUSE");
return 0;
}
```

Given below is the output of the above program.



```
50
45
40
35
30
25
20
15
10
5
Press any key to continue . . . _
```

ACTIVITIES

1. Write a C++ program that will display your name 5 times.
(4 marks)
2. Write a C++ program that will display all odd numbers from 1 to 31.
(6 marks)