

Introduction to Algorithms and Programming

Lecture 5

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While Loops

Used when the number of iterations isn't know, but the condition is clear

How to use it ?

1 initialization;

2

while(condition)

{

3

// statements

increment or decrement;

4

}

Example 1 – Print (hello world) ten times:

```
#include<iostream>
using namespace std;
int main() {
    int i = 1;
    while (i<=10)
    {
        cout << "Hello world " << endl;
        i++;
    }
    system("pause");
    return 0;
}
```

Example 2 – Print numbers between 1 and 10:

```
#include<iostream>
using namespace std;
int main() {
    int i = 1;
    while (i<=10)
    {
        cout << i << endl;
        i++;
    }
    system("pause");
    return 0;
}
```

Example 3 – Print an even numbers between 0 and 100:

```
#include<iostream>
using namespace std;
int main() {
    int i = 0;
    while (i<=10)
    {
        if (i % 2 == 0)
            cout << i << endl;
        i++;
    }
    system("pause");
    return 0;
}
```

Example 4 – the sum of the numbers from 1 to 10:

```
#include<iostream>
using namespace std;
int main() {
    int i = 1;
    int sum = 0;
    while (i<=10)
    {
        sum = sum + i;
        i++;
    }
    cout << "sum= " << sum << endl;
    system("pause");
    return 0;
}
```

Do-While Loops

- Do-while loops are variant of while loops.
- This loop will execute the code block once, before checking if the condition is true, then it will repeat the loop as long as the condition is true.

How to use it ?

1 initialization;

do{

2

// statements

3

increment or decrement;

}

While(condition);

4

Example 1 – Print (hello world) ten times:

```
#include<iostream>
using namespace std;
int main() {
    int i = 1;
    do
    {
        cout << "Hello world " << endl;
        i++;
    }
    while (i<=10);
    system("pause");
    return 0;
}
```


Example 2 – Print numbers between 1 and 10:

```
#include<iostream>
using namespace std;
int main() {
    int i = 1;
    do
    {
        cout << i << endl;
        i++;
    }
    while (i<=10);
    system("pause");
    return 0;
}
```

Example 3 – Print an even numbers between 0 and 100:

```
#include<iostream>
using namespace std;
int main() {
    int i = 0;
    do
    {
        if (i % 2 == 0)
            cout << i << endl;
        i++;
    }
    while (i<=10);
    system("pause");
    return 0;
}
```

Example 4 – the sum of the numbers from 1 to 10:

```
#include<iostream>
using namespace std;
int main() {
    int i = 0;
    int sum = 0;
    do
    {
        sum = sum + i;
        i++;
    }
    while (i<=10);
    cout << "sum= " << sum << endl;
    system("pause");
    return 0;
}
```

Assignment

- **Write a C++ program that prints numbers between two numbers chosen by the user.**