

# The for Loop

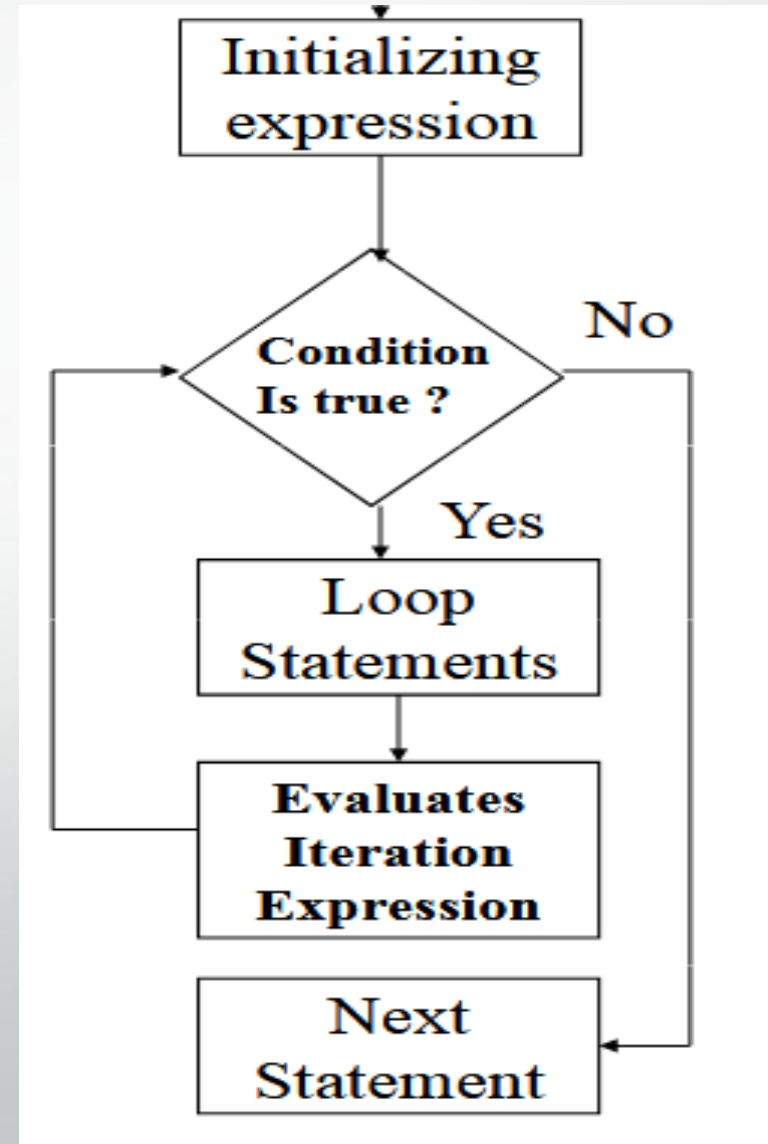
```
for (initialization; condition; iteration)
```

```
{
```

```
    loop statements
```

```
}
```

```
Next statement
```



# The for Loop

- The initialization (also called initialization expression) is used to set the loop control variable.
- A loop control variable is the one who is usually controlling the execution of loop by being a part of the condition
- The condition is a relational expression that determines when the loop exits.
- The iteration (also called iteration expression) defines how the loop control variable changes each time the loop is repeated.

All these three sections must be separated by semicolon “;”.

# Example

Displays the squares of first 15 numbers.

```
#include <iostream>
using namespace std;
int main()
{
    int iNumber;
    for(iNumber = 1; iNumber <= 15; iNumber++)
    {
        cout << "The Square of " << iNumber << " is: " << (iNumber * iNumber) << endl;
    }
}
```

# Nested Loops

- A loop can be placed inside other loops.
- Different types of loops can be nested inside each other e.g. a for loop within a while etc.

# Nested Loops

Pattern:

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

\* \* \* \* \*

- What would be the code to draw this pattern on screen?

# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=5;i++)
    {
        for(int j=1; j<=5; j++)
        {
            cout << "*";
        }
        cout << endl;
    }
}
```

# Nested Loops

Pattern:

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

- What would be the code to draw this pattern on screen?
- Solution:     Performed in class

# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<=i;j++)
        {
            cout<<"*";
        }
        cout<<endl;
    }
}
```



# Nested Loops

Pattern:

```
* * * * *  
* * * *  
* * *  
* *  
*
```

- What would be the code to draw this pattern on screen?
- Solution:    Performed yourself

# Nested Loops

Pattern:

```
  *  
 * *  
* * *  
* * * *  
* * * * *
```

- What would be the code to draw this pattern on screen?
- Solution:     Performed in tutorial

# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=5;i++)
    {
        for(int j=4;j>=i;j--)
        {
            cout<<" ";
        }
        for(int k=1;k<=i;k++)
        {
            cout<<"*";
        }
        cout<<endl;
    }
}
```

# Nested Loops

Pattern:

```
* * * * *  
* * * *  
* * *  
* *  
*
```

- What would be the code to draw this pattern on screen?
- Solution:     Performed in tutorial

# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=5;i++)
    {
        for(int j=1;j<i;j++)
        {
            cout<<" ";
        }
        for(int k=5;k>=i;k--)
        {
            cout<<"*";
        }
        cout<<endl;
    }
}
```

# Nested Loops

Pattern:

```
    *  
  * * *  
 * * * * *  
* * * * * *
```

- What would be the code to draw this pattern on screen?

# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=4;i++)
    {
        for(int j=4;j>i;j--)
        {
            cout<<" ";
        }
        for(int k=1;k<=(2*i)-1;k++)
        {
            cout<<"*";
        }
        cout<<endl;
    }
}
```

# Nested Loops

Pattern:

```
* * * * *  
 * * * *  
  * * *  
   *
```

- What would be the code to draw this pattern on screen?



# Code

```
#include <iostream>
using namespace std;
int main()
{
    for(int i=1;i<=4;i++)
    {
        for(int j=1;j<i;j++)
        {
            cout<<" ";
        }
        for(int k=7;k>=(2*i)-1;k--)
        {
            cout<<"*";
        }
        cout<<endl;
    }
}
```



End.