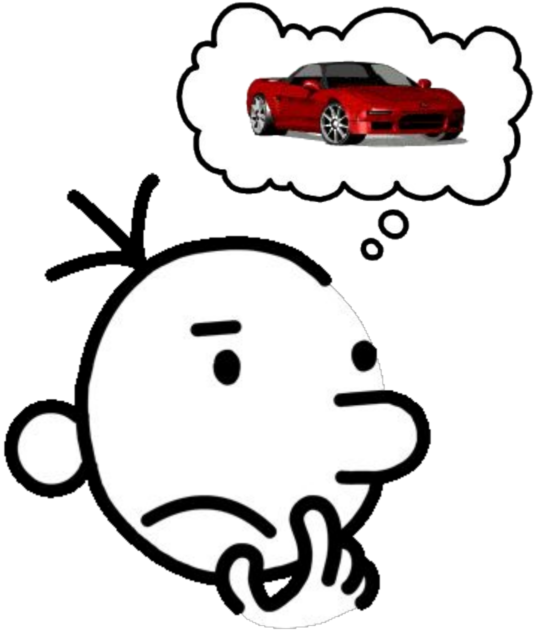
Conditions in C++

Why do we need Conditions?

When we add some kind of condition on some task, this is called conditional statement.

If I had the Money,
I would buy a Car



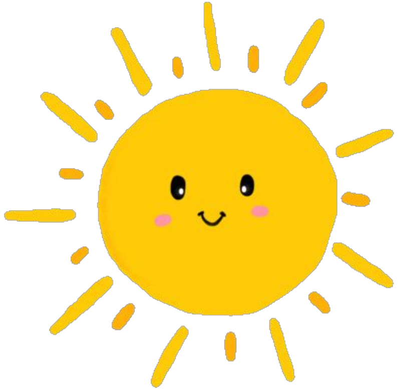
Why do we need Conditions?

We speak many Conditional Statements daily in our life.

If there will be Good Weather
then we will go on Picnic.

Why do we need Conditions?

We speak many Conditional Statements daily in our life.



If there will be no Rain, then we will go to Market

Why do we need Conditions?

We speak many Conditional Statements daily in our life.

If it will be a Sunny Day, then we will go to play Football.

Why do we need Conditions?

We speak many Conditional Statements daily in our life.

If you do my homework then i will offer you a Burger.

Why do we need Conditions?

As Programming solves Real World problems; therefore, it also needs the Conditional Statements.

Review: Input/Output in C++

Before understanding Conditional Statements in Programming, let's Practice taking Input and displaying Output which we have already learned in previous week.

Review: Input/Output in C++

Write a Program, that takes name as Input, and Prints Welcome with the Name.

Review: Input/Output in C++

Write a Program, that takes name as Input, and Prints Welcome with the Name.

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

main(){
    string name;
    cout << "Please Enter your name: ";
    cin >> name;
    cout << "Welcome " << name;
}
```

What should we do?

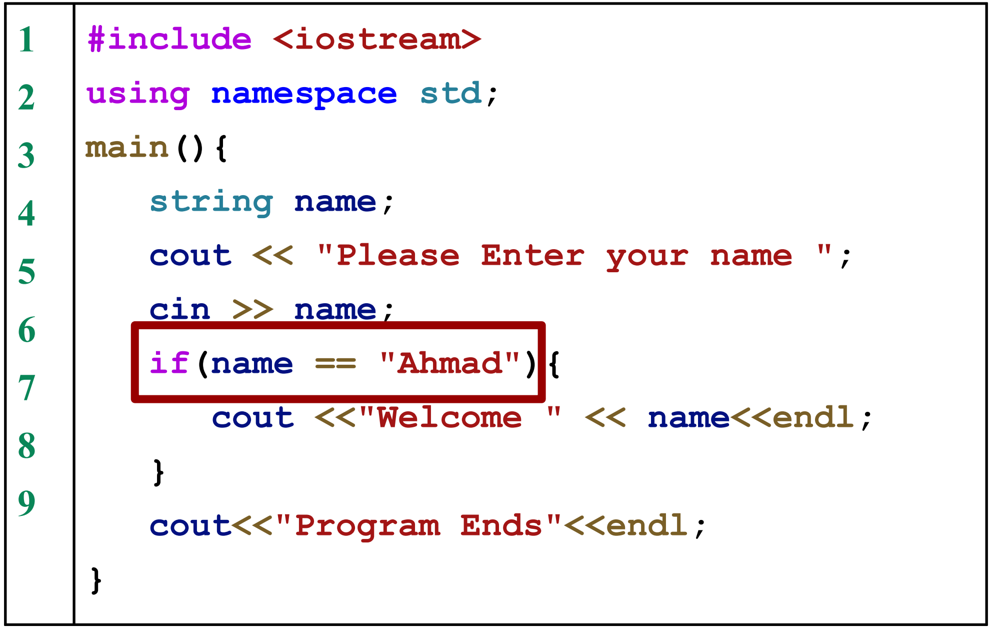
Now, we want to make changes in the following Program so it prints Welcome with name only when the name is Ahmad.

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

main(){
    string name;
    cout << "Please Enter your name: ";
    cin >> name;
    cout << "Welcome " << name;
}
```

IF Statement

Now, we want to make changes in the following Program so it prints Welcome with name only when the name is Ahmad.

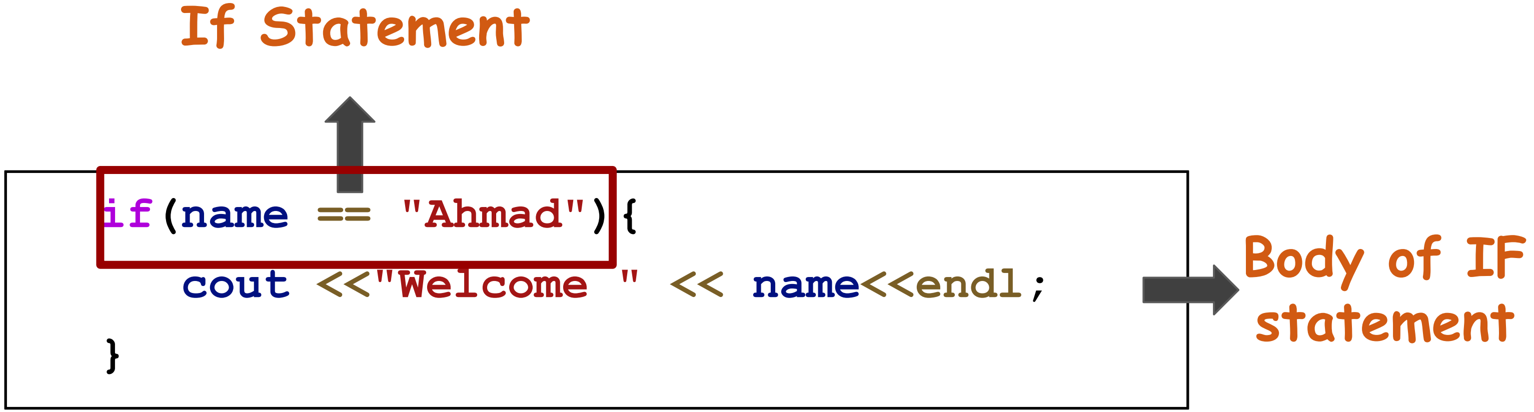


```
#include <iostream>
using namespace std;
main(){
   string name;
   cout << "Please Enter your name ";
   cin >> name;
   if(name == "Ahmad"){
      cout <<"Welcome " << name<<endl;
   }
   cout<<"Program Ends"<<endl;
}
```

IF Statement

This is a conditional statement. IF statement has following two parts

- IF statement
- Body of IF statement



If Statement

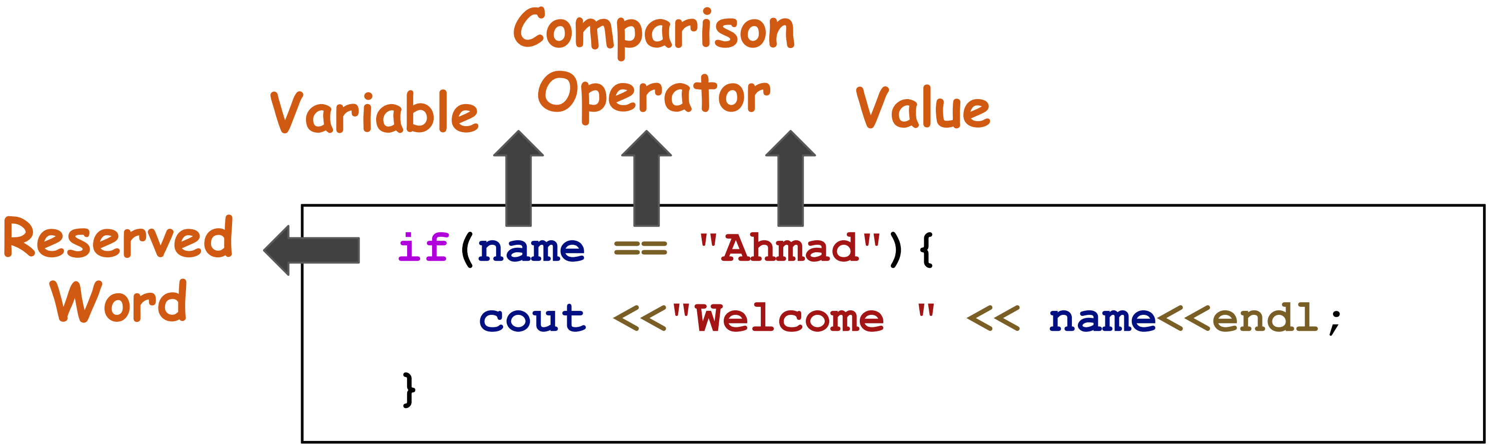
```
if(name == "Ahmad"){
    cout <<"Welcome " << name<<endl;
}
```

Body of IF statement

IF Statement

This is a conditional statement. IF statement has following two parts

- IF statement
- Body of IF statement



Comparison Operator

Variable

Value

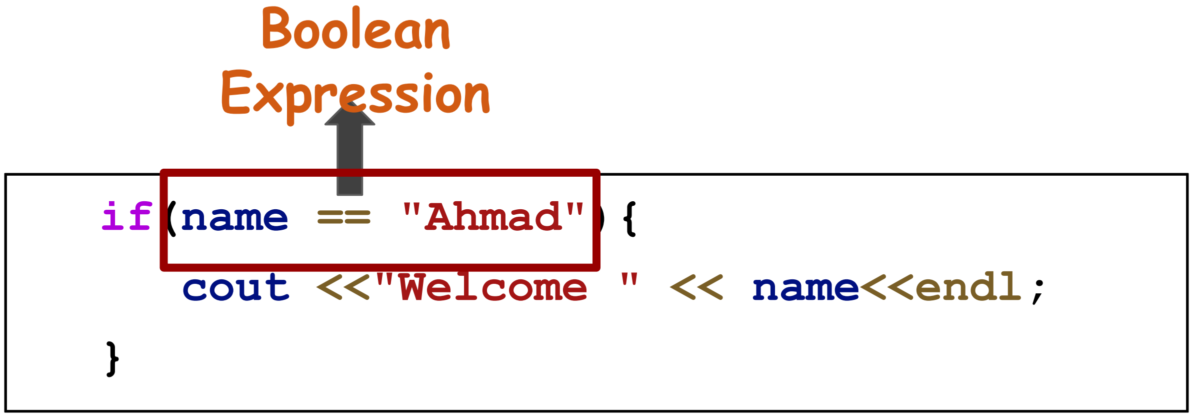
Reserved Word

```
if(name == "Ahmad"){
    cout <<"Welcome " << name<<endl;
}
```

IF Statement: Boolean Expression

This is a conditional statement. IF statement has following two parts

- IF statement
- Body of IF statement



Boolean Expression

```
if(name == "Ahmad") {
    cout <<"Welcome " << name<<endl;
}
```

IF Statement: Equal Comparison Operator

Following **Program** in C++ **prints Welcome with name** only when the name is **Ahmad**.

```cpp
#include <iostream>
using namespace std;
main(){
    string name;
    cout << "Please Enter your name ";
    cin >> name;
    if(name == "Ahmad"){
        cout <<"Welcome " << name<<endl;
    }
    cout<<"Program Ends"<<endl;
}
```

Equal (==) Comparison Operator

IF Statement: What Updates?

What if we want to always print **Welcome with name** when the name **is not Ahmad**.

```
#include <iostream>
using namespace std;
main(){
   string name;
   cout << "Please Enter your name ";
   cin >> name;
   if(name == "Ahmad"){
      cout <<"Welcome " << name<<endl;
   }
   cout<<"Program Ends"<<endl;
}
```

IF Statement: Not Equal Comparison Operator

What if we want to always print **Welcome with name** when the name **is not Ahmad**.

```
#include <iostream>
using namespace std;
main(){
    string name;
    cout << "Please Enter your name ";
    cin >> name;
    if(name != "Ahmad"){
        cout <<"Welcome " << name<<endl;
    }
    cout<<"Program Ends"<<endl;
}
```

Not Equal (!=) Comparison Operator

Comparison Operators

Other than Equal (==) and not Equal to (!=) there are many comparison Operators.

Comparison Operators list

Comparison Operators	Description	Applicable on	Example

==	Equal to	Textual Data
		Numeric Data
			if (“AB” == “AC”)
			if (5 == 5)

!=	Not equal to	Textual Data
		Numeric Data
			if (“AB” != “AC”)
			if (5 != 3)

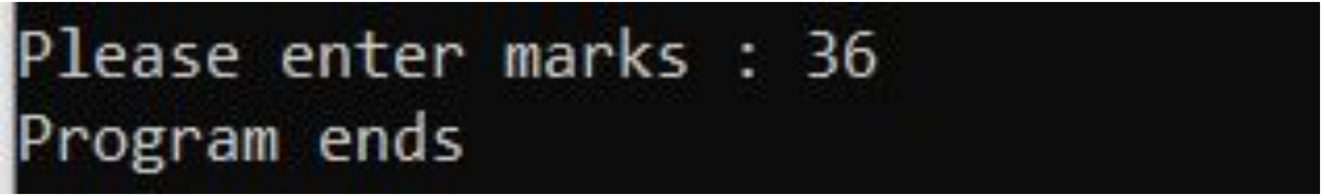
<	Less than	Numeric Data	if (2 > 4)
>	Greater Than	Numeric Data	if (4 < 4)
<=	Less than or equal to	Numeric Data	if (5 <= 90)
>=	Greater than or equal to	Numeric Data	if (66 >= 21)

Working Example

Write a program that takes marks of one subject from the user. If marks are more than 50 it displays “You passed” and “Program ends” and if marks are lesser than 50 it displays only “Program ends”.

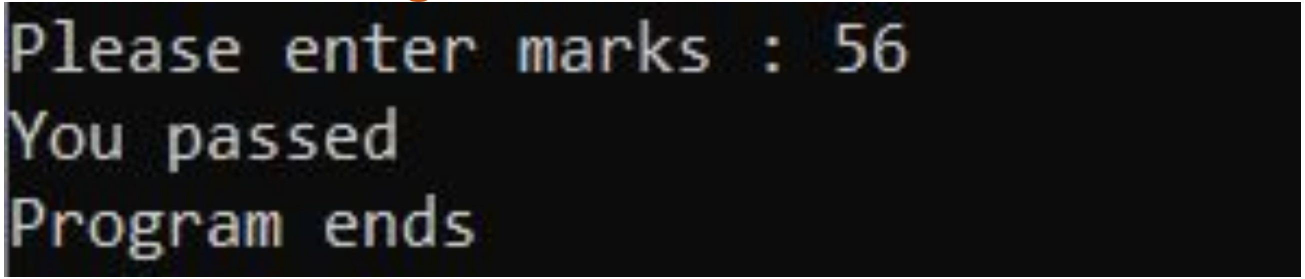
Expected Outputs

If user enters less than 50



```
Please enter marks : 36
Program ends
```

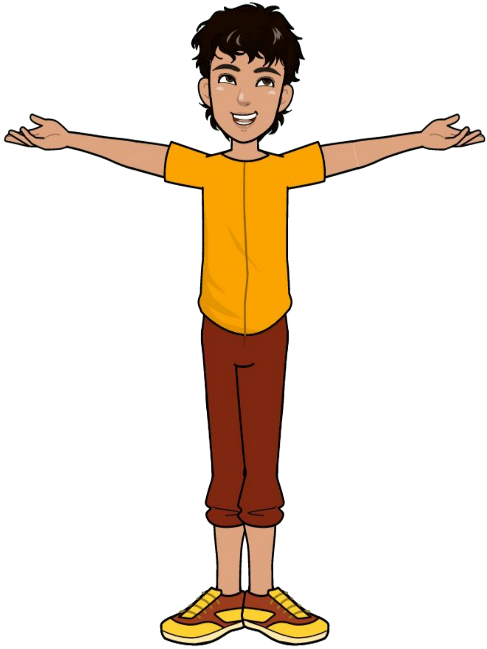
If user enters greater than 50



```
Please enter marks : 56
You passed
Program ends
```

Solution

```
#include <iostream>
using namespace std;
main(){
   int marks;
   cout<<"Please Enter Marks: ";
   cin>>marks;
   if(marks > 50){
      cout<<"You are Passed "<<endl;
   }
   cout<<"Program Ends";
}
```



Learning Objective

In this lecture, we learnt how to write a C++ program for conditional statements with a single Boolean expression consisting of a comparison operator.

Conclusion

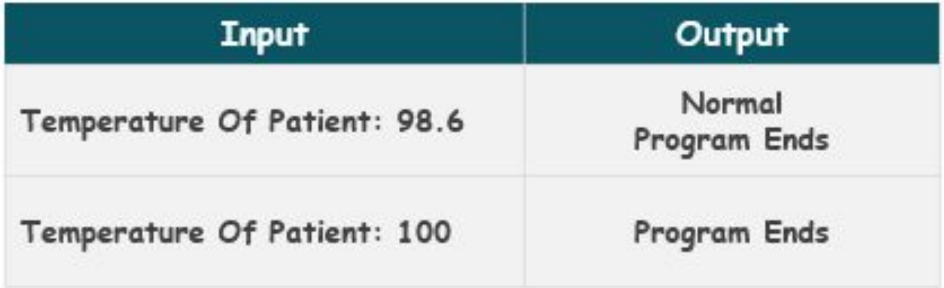
- To achieve decision making in programming, conditional structure is used.
- With the help of comparison operator we can compare values.
- A condition is also called a Boolean expression.

Self Assessment

Solve the Following Programs

1. Write a program that takes the temperature of a patient in Fahrenheit as input and prints “Normal” if the temperature is equal to 98.6

Test Cases



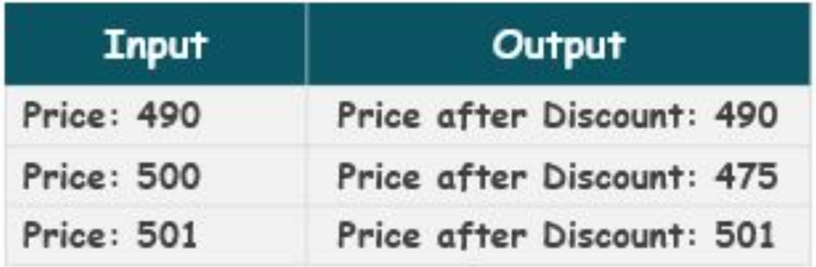
Input	Output
Temperature Of Patient: 98.6	Normal Program Ends
Temperature Of Patient: 100	Program Ends

Self Assessment

Solve Following Programs

2. Write a Program that takes the total price of the items bought by a customer. If the price is exactly equal to 500$ then it gives an overall 5% discount to the customer and displays the updated price.

Test Cases



Input	Output
Price: 490	Price after Discount: 490
Price: 500	Price after Discount: 475
Price: 501	Price after Discount: 501

Self Assessment

Solve Following Programs

3. Write a program which takes a number as input from the user. If the number is more than 200 it asks the user to enter 4 more numbers and displays the sum of the first 2 numbers and multiplication of the last 2 numbers on separate lines.

Self Assessment

Solve Following Programs

4. Write a program which takes a number from the user if the number is not equal to 200, it asks the user to enter 4 more numbers and displays the average of these numbers.