Decision Making (Control Flow Statements):

IF Statement

If-else

If-else if

If-else if – else

Nested if

IF Statement:

The C++ if statement is the simplest decision-making statement. It is used to decide whether a certain statement or block of statements will be executed or not executed based on a certain type of condition.

Syntax:

```
if(condition)
{
  // Statements to execute if condition is true
}
```

Program:

```cpp
#include<iostream>
using namespace std;
int main(){
    int budget;
    cout<<"Enter your Budget: ";
    cin>>budget;

    if(budget>2000000){
        cout<<"you can buy scorpio"<<endl;
    }
}
```

Output:

```
PS E:\C++ PROGRAMMES> g++ controlflow.cpp
PS E:\C++ PROGRAMMES> ./a.exe
Enter your Budget: 10000000
you can buy scorpio
```

if -else:

The if statement alone tells us that if a condition is true it will execute a block of statements and if the condition is false it won't. But what if we want to do something else if the condition is false. Here comes the C++ else statement. We can use the else statement with if statement to execute a block of code when the condition is false.

Syntax

```
if (condition)
{
    // Executes this block if
    // condition is true
}
else
{
    // Executes this block if
    // condition is false
}
```

Program:

```
#include<iostream>
using namespace std;
int main(){
    int budget;
    cout<<"Enter your Budget: ";
    cin>>budget;
    if(budget>2000000){
        cout<<"you can buy scorpio"<<endl;
    }
    else{
        cout<<"you can not buy scorpio"<<endl;
    }
}
```

Output:

```
PS E:\C++ PROGRAMMES> g++ controlflow.cpp
```

if – else if - else:

The if...else statement is used to execute a block of code among two alternatives. However, if we need to make a choice between more than two alternatives, we use the if...else if...else statement.

The syntax of the if...else if...else statement is:

```
if (condition1) {

  // code block 1

}

else if (condition2){

  // code block 2

}

else {

  // code block 3

}
```

We can write multiple else if statements

Program:

```
#include<iostream>

using namespace std;

int main(){

   int marks;

   cout<<"Enter Marks : ";

   cin>>marks;


   if(marks>90){

      cout<<"A"<<endl;

   }

   else if(marks>80){

      cout<<"B"<<endl;
```

```
        }
        else if(marks>70){
            cout<<"C"<<endl;
        }
        else if(marks>60){
            cout<<"D"<<endl;
        }
        else if(marks>50){
            cout<<"E"<<endl;
        }
        else{
            cout<<"Fail"<<endl;
        }
    }
```

Output:

```
PS E:\C++ PROGRAMMES> g++ controlflow.cpp

PS E:\C++ PROGRAMMES> ./a.exe

Enter Marks : 70

D

PS E:\C++ PROGRAMMES> ./a.exe

Enter Marks : 20

Fail
```

Nested if:

Nested if-else statements are those statements in which there is an if statement inside another if else. We use nested if-else statements when we want to implement multilayer conditions(condition inside the condition inside the condition and so on). C++ allows any number of nesting levels.

Basic Syntax of Nested if-else

```
if(condition1)

{

    // Code to be executed
```

```cpp
        if(condition2)

        {

            // Code to be executed

        }

    else

     {

      // Code to be executed

     }

}

else

{

   // code to be executed

}
```

Program:

```cpp
#include<iostream>

using namespace std;

int main(){

    int weight;

    cout<<"Enter weight : ";

    cin>>weight;

    if(weight>80){

      if(weight>100){

          cout<<"daily 5 km running + diet"<<endl;

      }

      else{

          cout<<"running"<<endl;

      }

    }

    else{

        cout<<"Do daily excercises"<<endl;
```

```
        }
    }
```

Output:

PS E:\C++ PROGRAMMES> g++ controlflow.cpp

PS E:\C++ PROGRAMMES> ./a.exe

Enter weight : 90

running

PS E:\C++ PROGRAMMES> ./a.exe

Enter weight : 28

Do daily excercises