Int types

Data Type	Size (in bytes)	Range
short int	2	-32,768 to 32,767
unsigned short int	2	0 to 65,535
unsigned int	4	0 to 4,294,967,295
int	4	-2,147,483,648 to 2,147,483,647
long int	4	-2,147,483,648 to 2,147,483,647
unsigned long int	4	0 to 4,294,967,295
long long int	8	$-(2^{63})$ to $(2^{63})-1$
unsigned long long int	8	0 to 18,446,744,073,709,551,615

Int types

signed char	1	-128 to 127
unsigned char	1	0 to 255
float	4	
double	8	
long double	12	
wchar_t	2 or 4	1 wide character

# <limits.h>

Name	Expresses
CHAR_MIN	Minimum value for an object of type char
CHAR_MAX	Maximum value for an object of type char
SCHAR_MIN	Minimum value for an object of type Signed char
SCHAR_MAX	Maximum value for an object of type Signed char
UCHAR_MAX	Maximum value for an object of type Unsigned char

Variables in C++

int age = 20; ⟵ value

datatype   variable_name

20

Reserved Memory for variable

RAM

GG
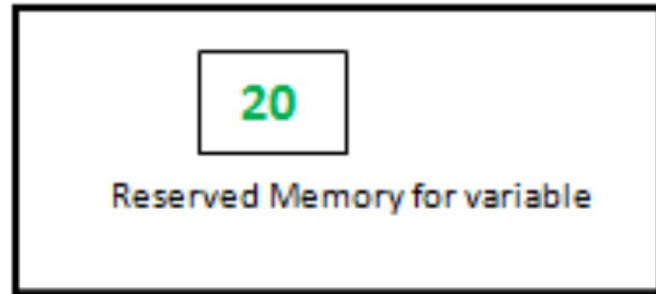
Объявление = declaration
Инициализация = initialization

Определение = definition
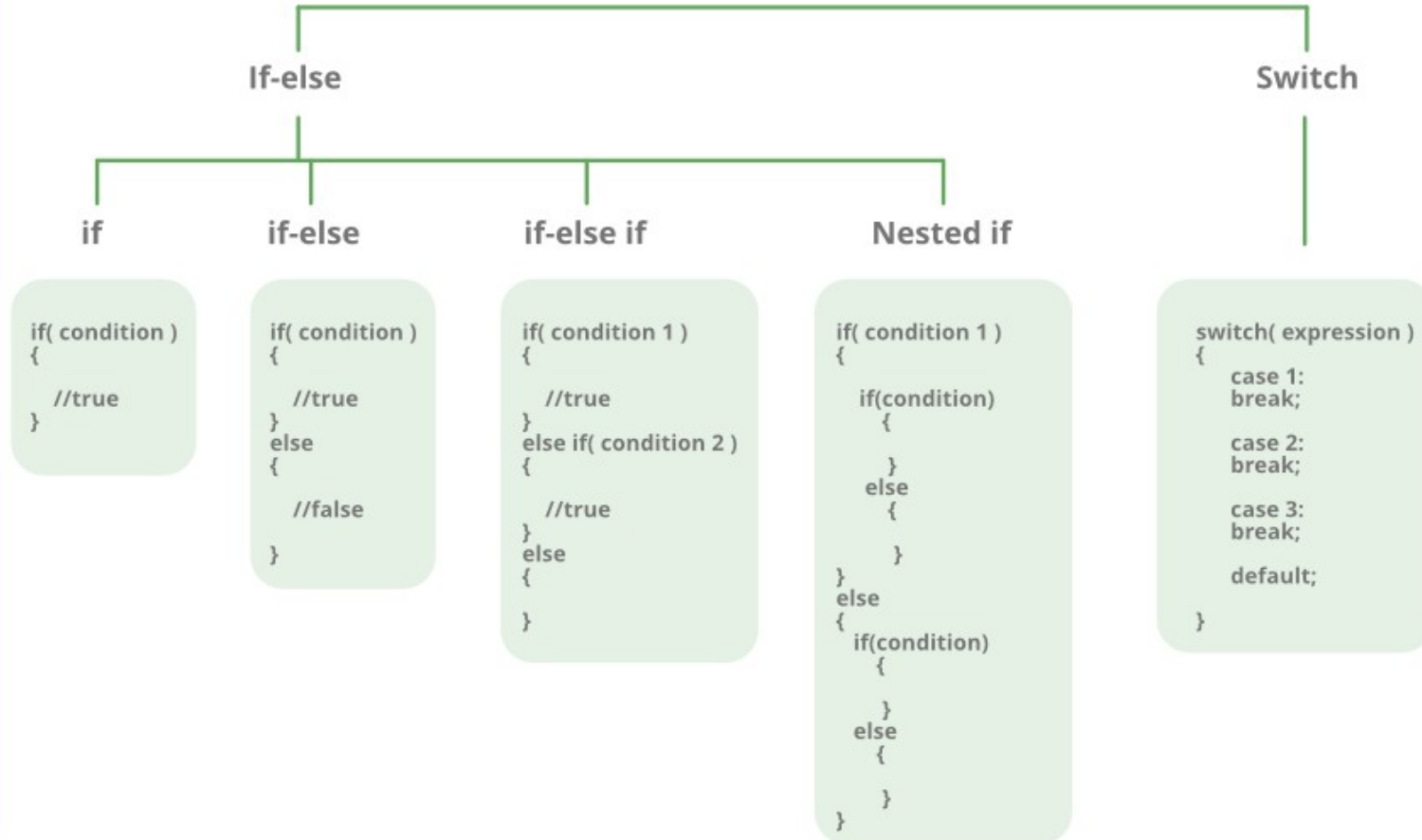
```
// this is declaration of variable a
int a;
// this is initialisation of a
a = 10;
// this is definition = declaration + initialisation
int b = 20;
```
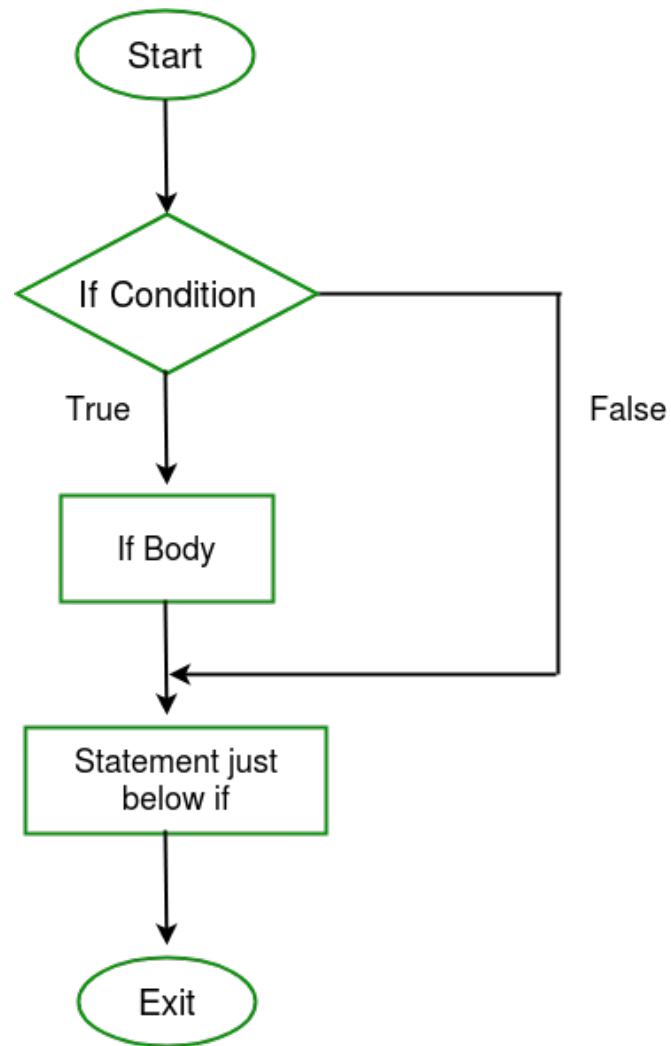
Decision Making

```
                              ┌──────────────┬──────────────┬──────────────────┐
           If-else                                                              Switch

    if                if-else           if-else if          Nested if

if( condition )    if( condition )    if( condition 1 )   if( condition 1 )   switch( expression )
{                  {                  {                   {                   {
   //true             //true             //true              if(condition)         case 1:
}                  }                  }                       {                     break;
                   else               else if( condition 2 )  }
                   {                  {                       else                  case 2:
                      //false            //true               {                     break;
                                      }                       }
                   }                  else                }                         case 3:
                                      {                   else                      break;
                                      }                   {
                                                             if(condition)          default;
                                                             {
                                                             }                  }
                                                             else
                                                             {
                                                             }
                                                          }
```

Оператор IF

```
if(condition)
{
    // Действия если
    // condition == true
}
```

```cpp
// C++ program to illustrate If statement
#include<iostream>
using namespace std;

    int main()
    {
        int i = 10;

        if (i > 15)
        {
            cout<<"10 is less than 15";
        }

        cout<<"I am Not in if";
    }
```
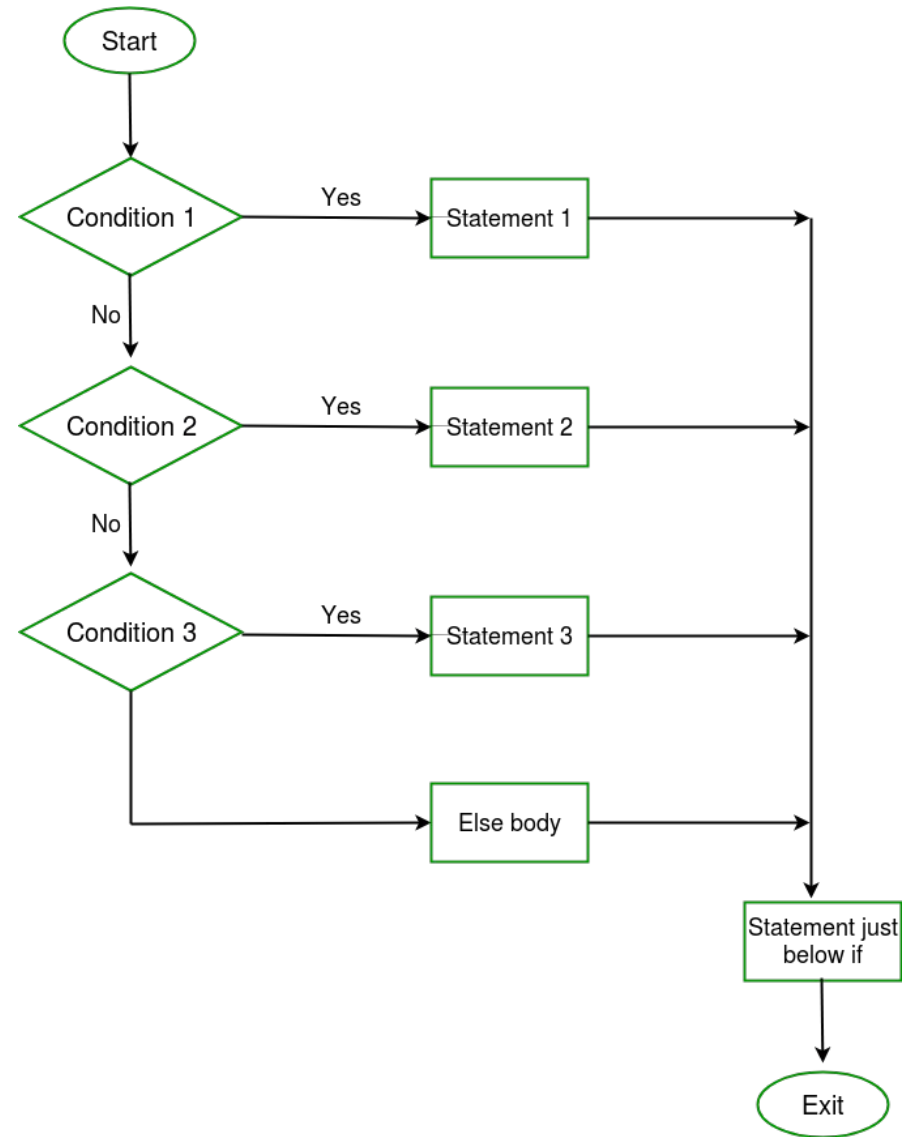
If - else

```cpp
// C++ program to illustrate if-else statement
#include<iostream>
using namespace std;

int main()
 {
        int i = 20;

        if (i < 15)
             cout<<"i is smaller than 15";
        else
             cout<<"i is greater than 15";

    return 0;
 }
```

nested-if

```
if (condition1)
{
   //Выполняется если condition1 == true
   if (condition2)
   {
      //Выполняется если condition2 == true
   }
}
```

```cpp
// C++ program to illustrate nested-if statement
#include <iostream>
using namespace std;

int main()
{
    int i = 10;

    if (i == 10)
    {
        // First if statement
        if (i < 15)
            cout<<"i is smaller than 15\n";

        // Nested - if statement
        // Will only be executed if statement above
        // is true
        if (i < 12)
            cout<<"i is smaller than 12 too\n";
        else
            cout<<"i is greater than 15";
    }

    return 0;
}
```

if-else-if ladder

if (condition)
    statement;
else if (condition)
    statement;
.
.
else
    statement;

Циклы

```c
int main()
{
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");
    printf( "Hello World\n");

    return 0;
}
```

Loops

Entry Controlled

for

```
for( initialization ; condition; updation)
{

}
```

while

```
while( condition )
{

}
```

Exit Controlled

do-while

```
do
{

}while( condition )
```

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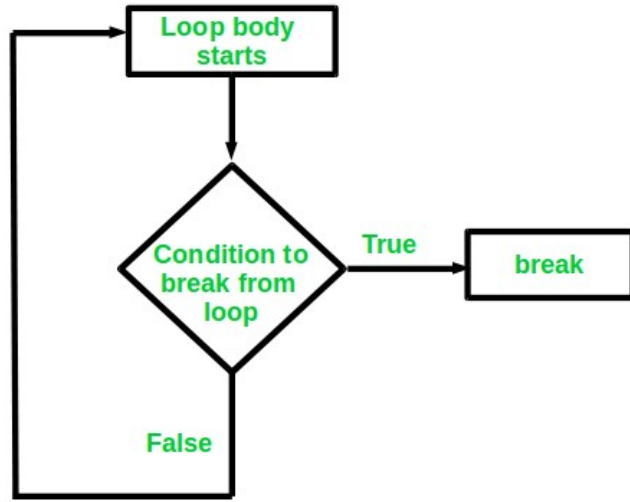
Цикл for

```
for (initialization expr; test expr; update expr)
{
    // body of the loop
    // statements we want to execute
}
```

```
for(int i = 0; i < n; i++){
}
```
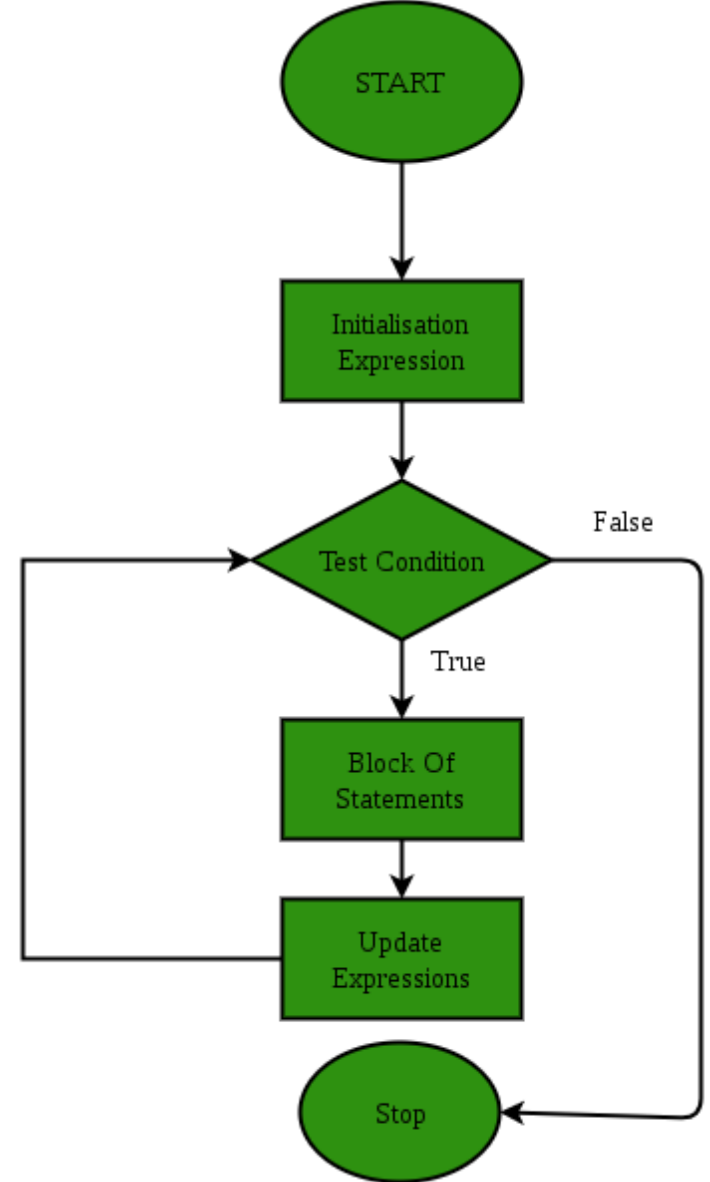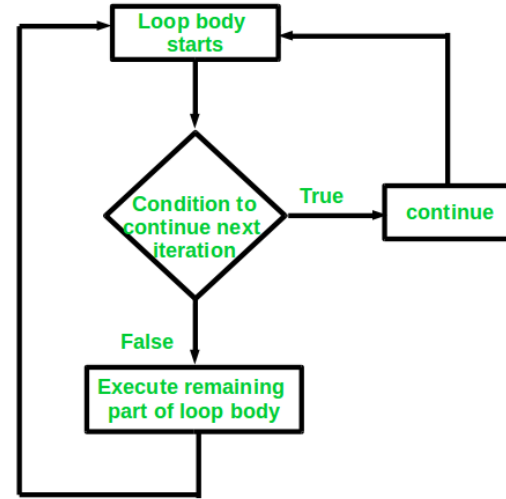
break


```cpp
for (int i = 0; i < size; i++) {
   if (arr[i] == key) {
      cout << "Element found at position: "
      << (i + 1);
      break;
   }
}
```

continue


```cpp
for (int i = 1; i <= 10; i++) {
      if (i == 6)
         continue;
      else
         cout << i << " ";
   }
```