

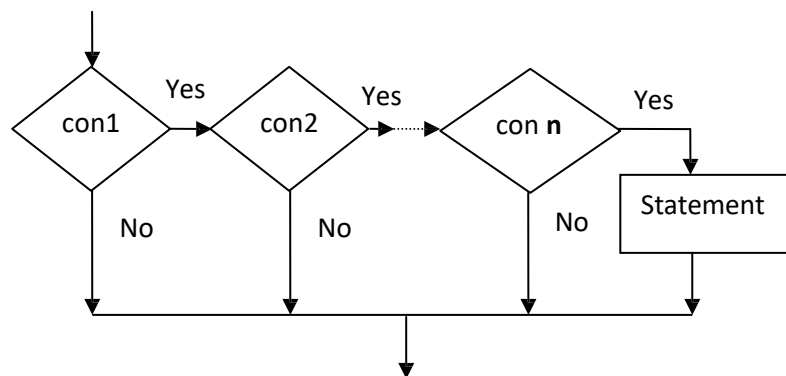
Selection (conditional) statement

- 1) if statement
- 2) if...else statements
- 3) Nested if statements
- 4) Switch statement

Nested if statements

1)

```
if (condition 1)
  if (condition 2)
  .
  .
  if (condition n)
    statement;
```



This type of nested if statements can also be written as follows:

```
if (condition1 && condition2 && ... && condition n)
  statement;
```

Example: Write a program that converts an integer number to character.

```
#include <iostream>
using namespace std;
int main()
{
  int number;
  cout<<"Enter an integer number: ";
  cin >> number;
  if (number >=0)
    if (number <=127)
      cout<<"The character is: "<<(char)number<<endl;
  return 0;
}
```

The two if statements can be replaced by the statement:

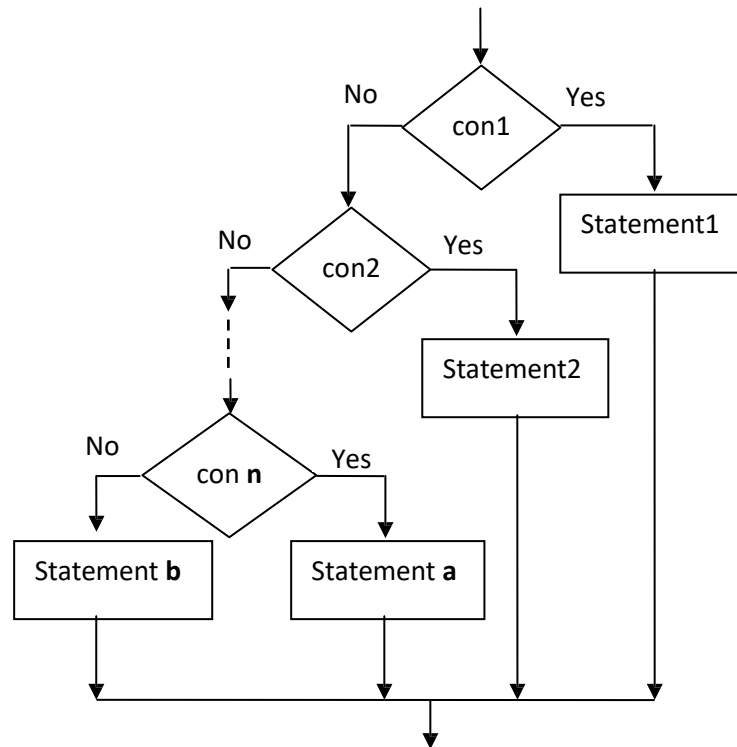
```
if (number >=0 && number <=127)
  cout<<"The character is: "<<(char)number<<endl;
```

2)

```

if (condition 1)
    statement1;
else
    if (condition 2)
        statement2;
    else
        .
        .
        if (condition n)
            statement a;
        else
            statement b;

```



Example: Write a C++ program that reads an average mark and prints the equivalent grade.

```

#include <iostream>
using namespace std;
int main()
{
    float average;
    cout<<"Enter an average mark: ";
    cin >> average;
    if(average >= 90)
        cout<<"Your grade is excellent."<<endl;
    else
        if(average >= 80)
            cout<<"Your grade is very good."<<endl;
        else
            if(average >= 70)
                cout<<"Your grade is good."<<endl;
            else
                if(average >= 60)
                    cout<<"Your grade is medium."<<endl;
                else
                    if(average >= 50)
                        cout<<"Your grade is pass."<<endl;
                    else

```

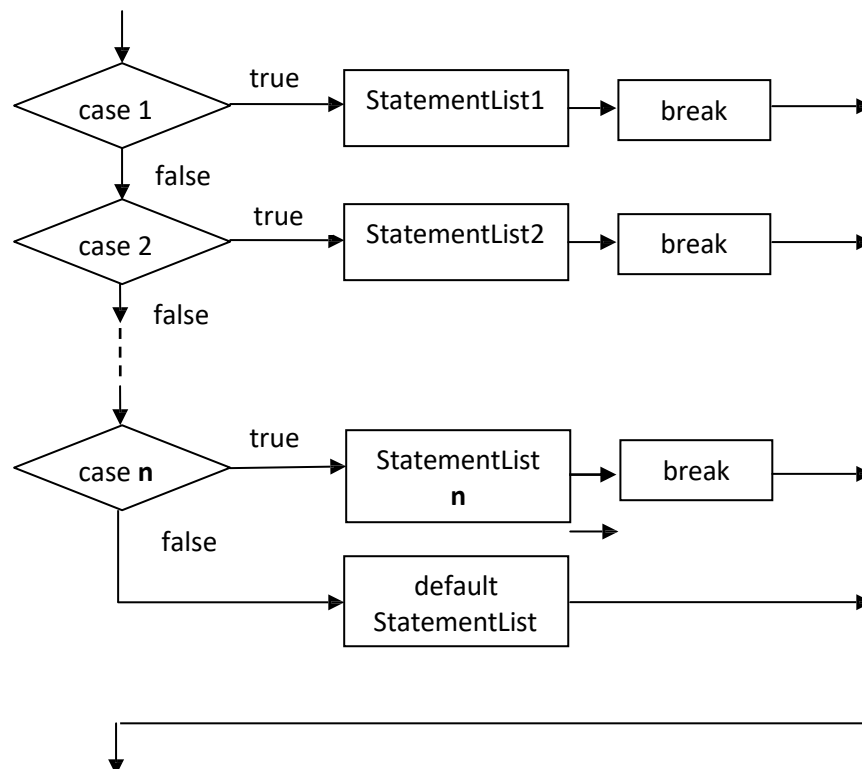
```
        cout<<"Your grade is fail."<<endl;
    return 0;
}
```

Example: Write a program that performs the arithmetic operations (+, -, *, /) determined by a user input.

```
#include <iostream>
using namespace std;
int main()
{
    float x , y;
    char op;
    cout<<"Enter value of x: ";
    cin >> x;
    cout<<"Enter value of y: ";
    cin >> y;
    cout<<"Enter operator: ";
    cin >> op;
    if(op == '+')
        cout << x+y;
    else
        if(op == '-')
            cout << x-y;
        else
            if(op == '*')
                cout << x*y;
            else
                if(op == '/')
                    cout << x/y;
                else
                    cout << "Invalid operation.";
    return 0;
}
```

Switch statement

```
switch (expression) {  
    case constant1: statementList1; break;  
    case constant2: statementList2; break;  
    .  
    .  
    case constantN: statementListN; break;  
    default: statementList;  
}
```



Example:

```
#include <iostream>  
using namespace std;  
int main()  
{  
    float x , y;  
    char op;  
    cout<<"Enter value of x: ";  
    cin >> x;  
    cout<<"Enter value of y: ";  
    cin >> y;  
    cout<<"Enter operator: ";  
    cin >> op;
```

```
switch(op) {
    case '+': cout<<x<<"+"<<y<<"="<<x+y; break;
    case '-': cout<<x<<"-"<<y<<"="<<x-y; break;
    case '*': cout<<x<<"*"<<y<<"="<<x*y; break;
    case '/': cout<<x<<"/"<<y<<"="<<x/y; break;
    default: cout<<"Invalid operation.";
}
return 0;
}
```

Example:

```
#include <iostream>
using namespace std;
int main()
{char g;
  cout <<"Enter your grade between A to F : ";
  cin >> g;
  switch(g)
  {case 'A':
    cout <<"Your average must between 90 - 100";break;
    case 'B':
    cout <<"Your average must between 80 - 89" ;break;
    case 'C':
    cout <<"Your average must between 70 - 79"; break;
    case 'D':
    cout <<"Your average must between 60 - 69" ; break;
    case 'E':
    cout <<"Your average must between 50 - 59" ; break;
    default:
      cout <<"Your average must between 0 - 49" ;
  }
  return 0;
}
```

Exercises:

1. What is the utilization of the following nested if subprogram?

```
if (ch >= '0' && ch <= '9')
    cout << "kind = digit";
else if (ch >= 'A' && ch <= 'Z')
    cout << "kind = capital letter";
else if (ch >= 'a' && ch <= 'z')
    cout << "kind = small letter";
else
    cout << "kind = special";
```

2. Suppose the input is 5. What is the value of alpha after executing the following C++ code?

```
cin>>alpha;
switch(alpha)
{
    case 1:
    case 2: alpha = alpha + 2; break;
    case 4: alpha++;
    case 5: alpha = 2 * alpha;
    case 6: alpha = alpha +5; break;
    default: --alpha;
}
```

3. Suppose the input is 3. What is the value of b after executing the following C++ code?

```
cin>>b;
switch(b)
{
    case 3: b = b + 3;
    case 1: b++; break;
    case 5: b = b +5;
    case 4: b = b +4;
}
```

4. Write a C++ program that computes the following equation:

$$y = \begin{cases} 5x^2 + 6 & 0 < x \leq 100 \\ 0 & x \leq 0 \\ x^2 + 4x + 4 & x > 100 \end{cases}$$

5. Write a program that reads a character and prints out whether it is a vowel or a consonant using switch case statement.