# principles of programming

# Selections

Department of Cybersecurity

5

# C++ Selection (if Statement)

- **One-Way (if) Selection**

Syntax

```
if (expression)
    {
       statement(s)
    }
```

```
if(mark >= 40)
{
      cout << "PASS";

}
```

- Statement executed if value of expression **true**

# C++ Selection (if Statement)

- **Two-Way (if...else)**

```
if (expression)
{
   statement1;
}
else
{
   statement2;
}
```

```
if(mark >=40)
{
    cout << "PASS";
}
else
{
    cout << "FAIL";
}
```

- If expression true, statement1 executed, otherwise statement2 executed

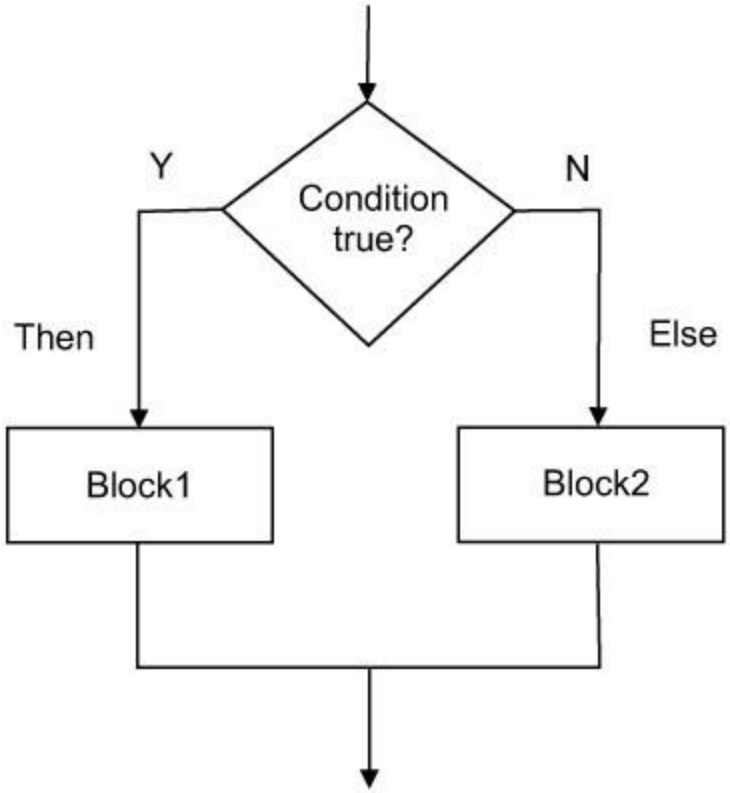
# if-then-else Statement

- Syntax

```
if (Condition) {
        statement(s)
}
Else
{
        statement(s)
}
```

- Example

```
if(mark >= 40)
{
    cout << "PASS";
}
else
{
    cout << "FALL";
}
```

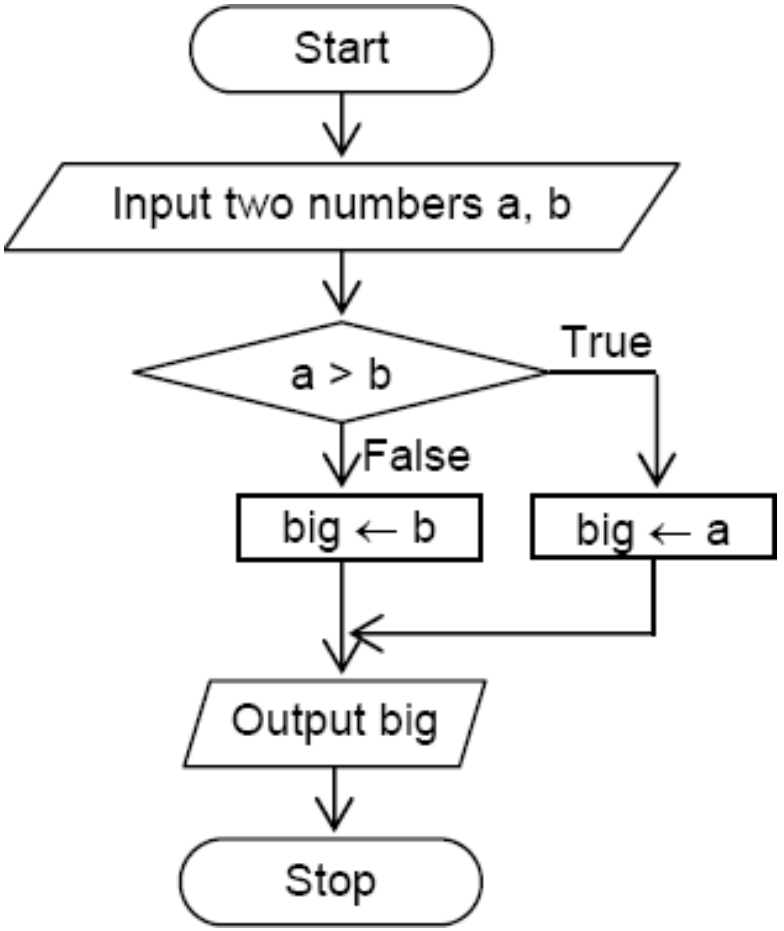


# C program to Check Whether a Number is Positive or Negative

```
int main ()
{
int num;
cout << "Enter the number to be checked : ";
cin >> num;
if (num >= 0)
cout << num << " is a positive number.";
else
cout << num << " is a negative number.";
return 0;
11.}
```

# Exercise 5.1

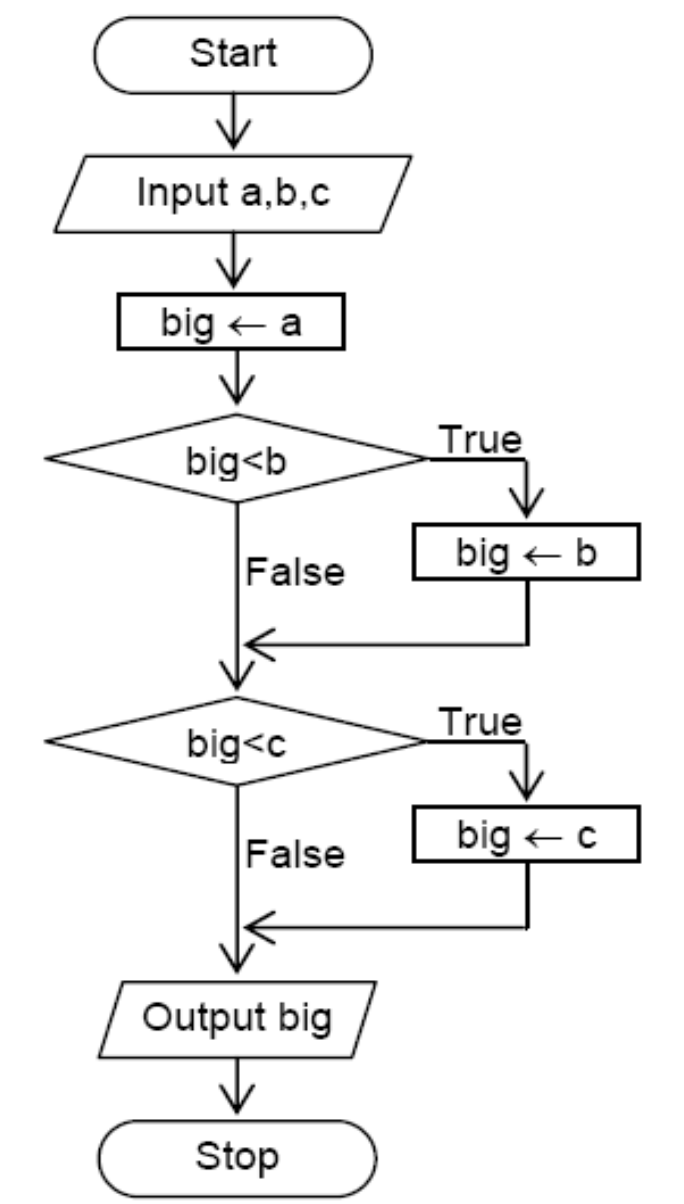
Write a C++ program to print the biggest number of the two given numbers



```
void main()
 { int a, b;
  cout<<"Enter first number:";
  cin>>a;
  cout<<"Enter second number:";
  cin>>b;

 if(a>b)
   { cout<< a <<" is thelargest"; }
 else
   { cout<< b <<" is the largest"; }
 }
```

# Exercise 5.2

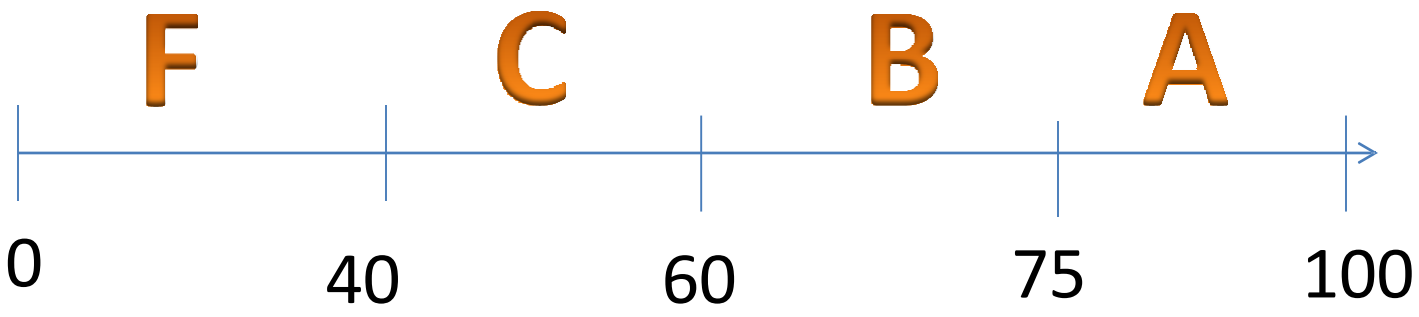
Write a C++ program to print the biggest number of the three given numbers



```
void main()
{
  float n1, n2, n3;
 cout << "Enter three numbers: ";
 cin >> n1 >> n2 >> n3;

 if (n1 >= n2 && n1 >= n3)
    cout << "Largest number: " << n1;

If (n2 >= n1 && n2 >= n3)
   cout << "Largest number: " << n2;

If (n3 >= n1 && n3 >= n2)
  cout << "Largest number: " << n3;
}
```

# Exercise 5.3

- Write a C++ program to print the grade for a given mark.



# Solution 1

```
if(mark >=0 && mark <40)
      cout << "F";
if(mark >=40 && mark <60)
      cout << "C";
if(mark >=60 && mark <75)
      cout << "B";
if(mark >=75 && mark <=100)
      cout << "A";
```

# Nested if and if...else Statements

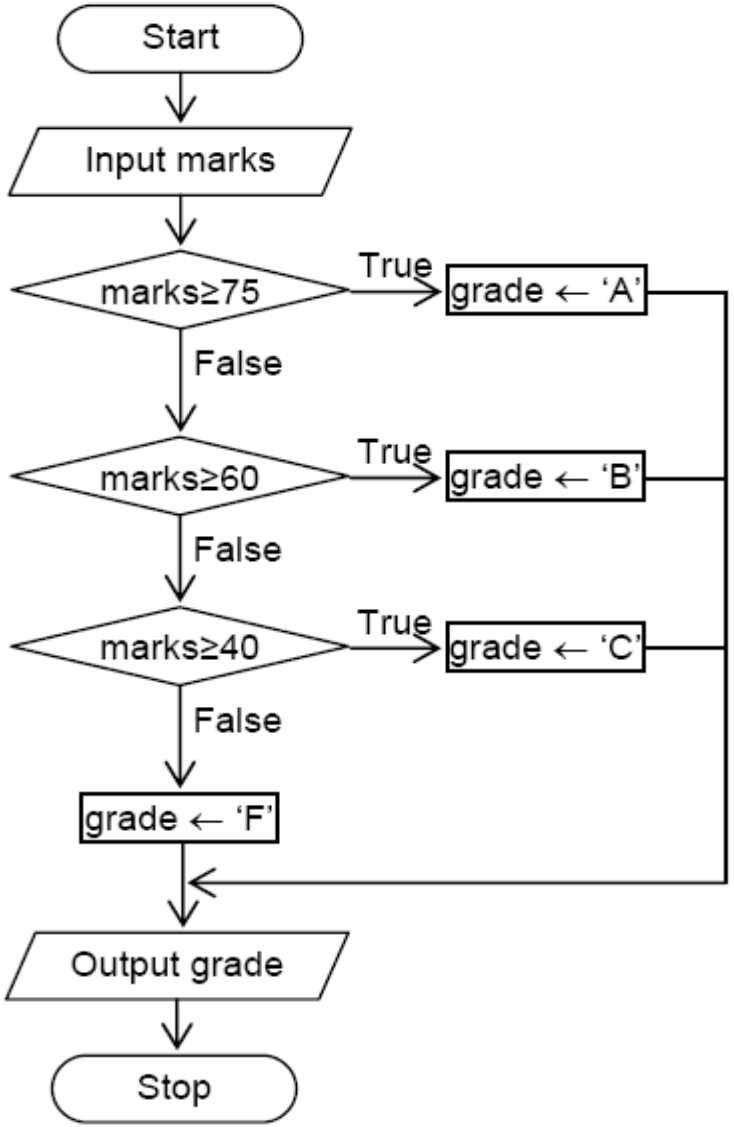
- **Nesting**: one control statement in another
- Syntax of nested if...else statements:

```
if (condition1)
        statement1;
   else if (condition2)
        statement2;
        . . .
        else if (condition-n)
                statement-n;
              else statement-z;
```

```
if (x < 0)
   y = -1;
else if (x == 0)
   y = 0;
else                    //(x > 0)
   y = 1;
}
```

# Exercise 5.4

Write a C++ program to print the grade for a given marks



```
Void Main()
{   int marks;
cout<<"Enter Your Marks: ";
cin>>marks;
if (marks >= 75){
cout<<"Your Grade is A";
}
else if (marks >= 60){
cout<<"Your Grade is B";
}
else if (marks >= 40){
cout<<"Your Grade is C";
}
else{
cout<<“ F";
}
}
```

# Exercise 5.5

- Write a C++ program that reads month as an integer and print the name of the month

# Switch

Run with number of possible execution paths

A switch works with the byte, short, char, and int primitive data types

# Switch

- switch structure: alternate to if...else

- **Example 1:**

```
switch(x)       {
        case x1:        Statements1;
                        break;

        case x2:        Statements2;
                        break;
        …
        default:        Statements4;
                        break;
                }
```

# switch case programming exercises

1.Write a C++ program to print day of week name using switch case.

2.Write a C++ program to find maximum between two numbers using switch case.

3.Write a C++ program to check whether a number is even or odd using switch case.

4.Write a C++ program to check whether a number is positive, negative or zero using switch case.

5.Write a C++ program to create Simple Calculator using switch case.

**1.Write a C++ program to check whether a number is positive, negative or zero using switch case.**

```
int main(){
int num;
cout<<"Enter any number to check even or odd: ";
cin>>num;
switch(num % 2)
{
case 0:  cout<<"Number is even";
break;

case 1:  cout<<"Number is odd";
break;
}
return 0;
}
```

**1.Write a C++ program to print day of week name using switch case.**

```
int main()
{
int weeknumber;
cout<<"Enter week number(1-7): ";
cin>>weeknumber;
switch(weeknumber)
{
case 1: cout<<"Monday";
break;
case 2: cout<<"Tuesday";
break;
case 3: cout<<"Wednesday";
break;
case 4: cout<<"Thursday";
break;
case 5: cout<<"Friday";
break;
case 6: cout<<"Saturday";
break;
case 7: cout<<"Sunday";
break;
default: cout<<"Invalid input! Please enter week no. between 1-7.";
}
return 0;
}
```

**1.Write a C++ program to find maximum between two numbers using switch case.**

```
void main()
{
int n1,n2;
cout<<"enter n1"<<endl;
cin>>n1;
cout<<"enter n2"<<endl;
cin>>n2;
switch(n1>n2)
{
case 0:
  cout<<n1<<"is not greater"<<endl;
break;

case 1:
   cout<<n1<<"is greater"<<endl;
break;

default:
cout<<"invalid"<<endl;
}
}
```

# Exercise 5.6

- Write a C++ program that reads month as an integer and print the name of a month. (Use Switch)

```
switch(month)
{
      case 1: cout << "JANUARY";
              break;
      case 2: cout << "FEBRUARY";
              break;

      default: cout<<"ERROR";
              break
}
```

# Exercise 5.7

- Write a C++ program that reads day as an integer (1-7 ) and print the name
  - Use only if-else statement and implement your solution
  - Use switch statement and implement your solution
- Draw flowcharts to above two programs

# Exercise 5.9

- Write a C++ program to print the bill for an item bought by a customer from a shop.
  - The program should ask unit price and quantity of an item and calculate the total cost
  - If item quantity greater than 10 give one item free
  - Add 3.5 % discount for the total if total cost grater than 2500.