MM PG College Fatehabad

The Basic of "C++"

Class B.Sc. (CS)

Year 3rd

Semester 5th

A C++ program

```
//include headers; these are modules that include functions that you may use in your
 //program; we will almost always need to include the header that
// defines cin and cout; the header is called iostream.h
#include <iostream.h>

int main() {

//variable declaration
//read values input from user
//computation  and print output to user
return 0;
}
```

After you write a C++ program you compile it; that is, you run a program called **compiler** that checks whether the program follows the C++ syntax

- if it finds errors, it lists them
- If there are no errors, it translates the C++ program into a program in machine language which you can execute

Notes

- what follows after // on the same line is considered comment
- indentation is for the convenience of the reader; compiler ignores all spaces and new line ; the delimiter for the compiler is the semicolon
- all statements ended by semicolon
- **Lower vs. upper case matters!!**
  - Void is different than void
  - Main is different that main

The infamous **Hello world** program

When learning a new language, the first program people usually write is one that salutes the world :)

Here is the Hello world program in C++.

```
#include <iostream.h>
int main() {
    cout << “Hello world!”;

     return 0;
}
```

Variable declaration

type variable-name;

Meaning: variable <variable-name> will be a variable of type <type>

Where type can be:

- int //integer
- double //real number
- char //character

Example:

```
int a, b, c;
double x;
int sum;
char my-character;
```

Input statements

cin >> variable-name;

Meaning: read the value of the variable called <variable-name> from the user

Example:

```
cin >> a;
cin >> b >> c;
cin >> x;
cin >> my-character;
```

Output statements

cout << variable-name;

Meaning: print the value of variable <variable-name> to the user

cout << “any message “;

Meaning: print the message within quotes to the user

cout << endl;

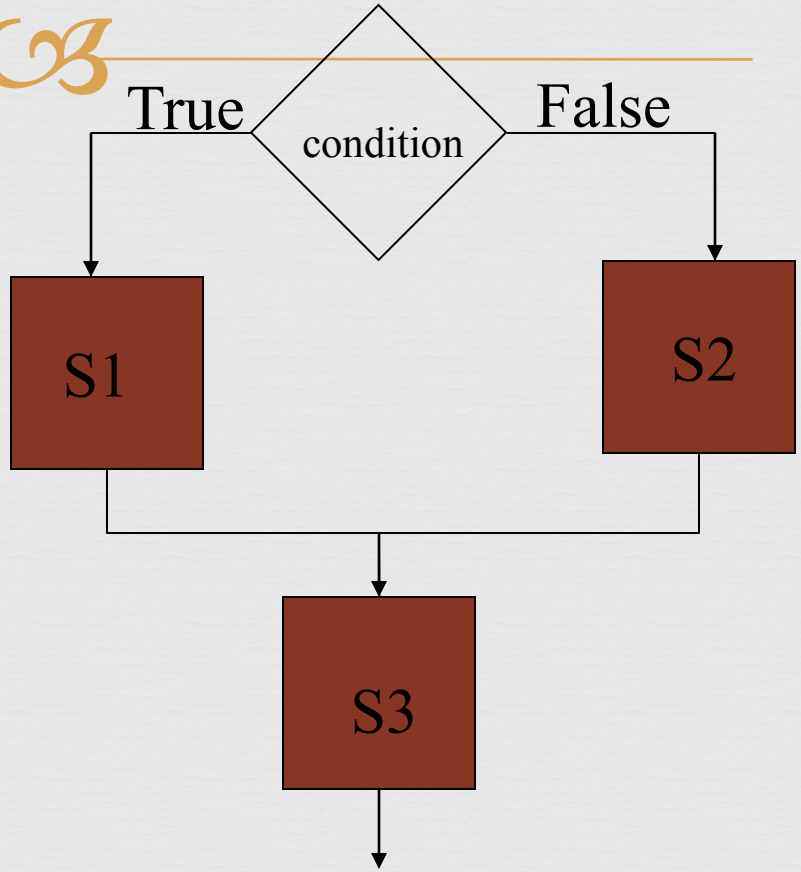
Meaning: print a new line

Example:

```
cout << a;
cout << b << c;
cout << “This is my character: “ << my-character << “ he he he”
        << endl;
```

If statements

```
if (condition) {
    S1;
}
else {
    S2;
}
S3;
```



Boolean conditions

- Comparison operators

  == equal

  != not equal

  < less than

  > greater than

  <= less than or equal

  >= greater than or equal

- Boolean operators

  && and

  || or

  ! not

Examples

Assume we declared the following variables:

```
int a = 2, b=5, c=10;
```

Here are some examples of boolean conditions we can use:

- if (a == b) …
- if (a != b) …
- if (a <= b+c) …
- if(a <= b) && (b <= c) …
- if !((a < b) && (b<c)) …

If example

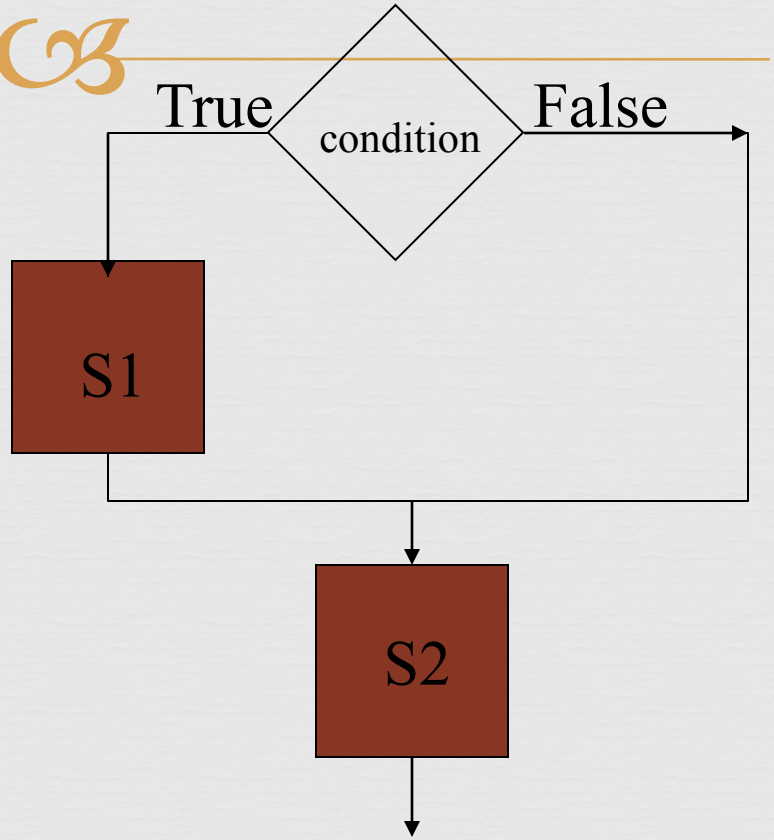
```
#include <iostream.h>

void main() {
int a,b,c;
cin >> a >> b >> c;

if (a <=b) {
      cout << “min is “ << a << endl;
      }
else {
      cout << “ min is “ << b << endl;
}
cout << “happy now?” << endl;
}
```

While statements

```
while (condition) {
    S1;
}
S2;
```



While example

```
//read 100 numbers from the user and output their sum
#include <iostream.h>

void main() {
int i, sum, x;
sum=0;
i=1;
while (i <= 100) {
      cin >> x;
      sum = sum + x;
      i = i+1;
}
cout << “sum is “ << sum << endl;
}
```

Exercise

- Write a program that asks the user
  - Do you want to use this program? (y/n)
- If the user says ‘y’ then the program terminates
- If the user says ‘n’ then the program asks
  - Are you really sure you do not want to use this program? (y/n)
  - If the user says ‘n’ it terminates, otherwise it prints again the message
  - Are you really really sure you do not want to use this program? (y/n)
  - And so on, every time adding one more “really”.