Lecture -3

Conditionals

We'll Learn Today

- Conditionals
- If Statements
- Ternary Conditions
- Switch Statements
- Exercise

Conditionals

- **This Chapter deals with the various methods that C can control the *flow* of logic in a program. Apart from slight syntactic variation they are similar to other languages.**
- **As we have seen following logical operations exist in C:**

  ==, !=, , &&.
- **One other operator is the unary - it takes only one argument - *not* !.**
- **These operators are used in conjunction with the following statements.**

The if Statement

The if statement has the same function as other languages. It has three basic forms:

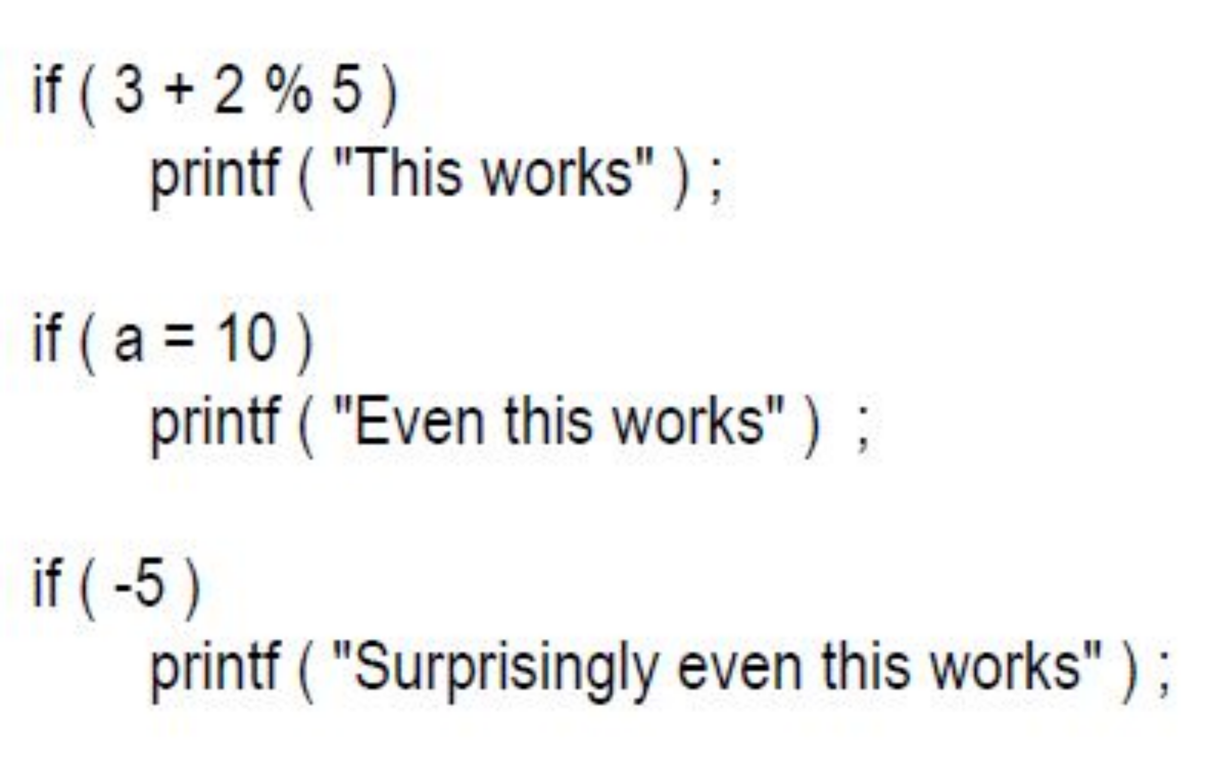
```
      if  (expression)
            statement
...or:
      if  (expression)
            statement1
      else
            statement2
...or:
      if  (expression)
            statement1
      else if (expression)
            statement2
      else
            statement3
```

The if Statement (con't)

For example:-

```
int x,y,z,w;
    main()
        {
        if (x>0)
           {
              z=w;
              ........
           }
       else
              {
                  z=y;
                  ........
              }
        }
```

The Real Thing

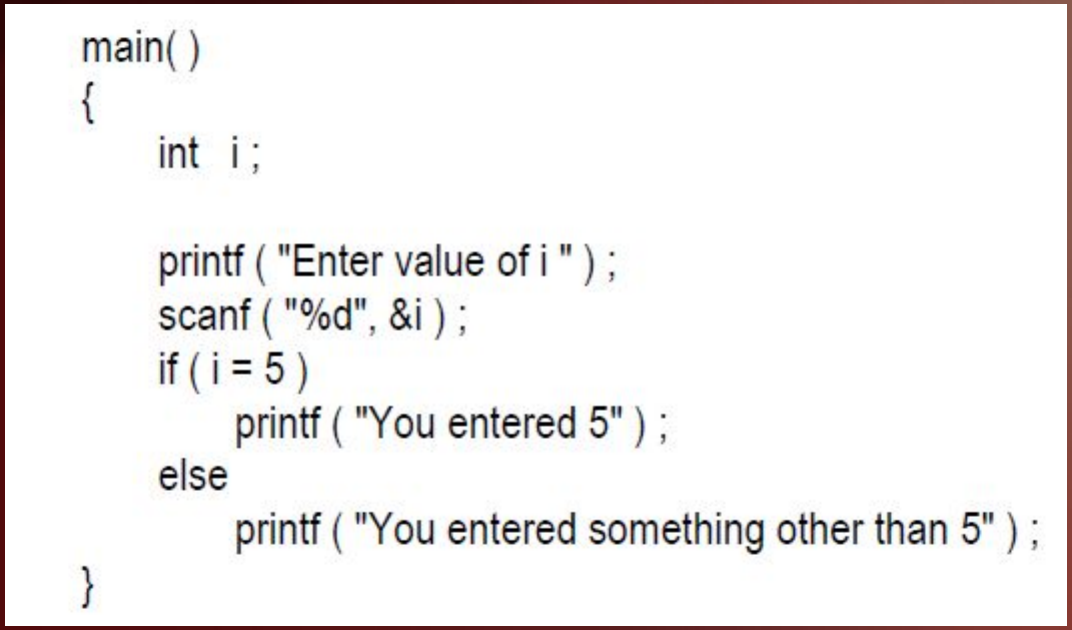


```
if ( 3 + 2 % 5 )
      printf ( "This works" ) ;

if ( a = 10 )
      printf ( "Even this works" )  ;

if ( -5 )
      printf ( "Surprisingly even this works" ) ;
```

What is the Output of this program?



```
main( )
{
        int   i ;

        printf ( "Enter value of i " ) ;
        scanf ( "%d", &i ) ;
        if ( i = 5 )
                printf ( "You entered 5" ) ;
        else
                printf ( "You entered something other than 5" ) ;
}
```

The ? Operator

- **The ? (*ternary condition*) operator is a more efficient form for expressing simple if statements. It has the following form:**

  expression1* ? *expression2*: *expression3

- **It simply states:**

  if *expression1* then *expression2* else *expression3*

The ? Operator (con't)

For example to assign the maximum of a and b to z:

```
    z = (a>b) ? a : b;
```

which is the same as:

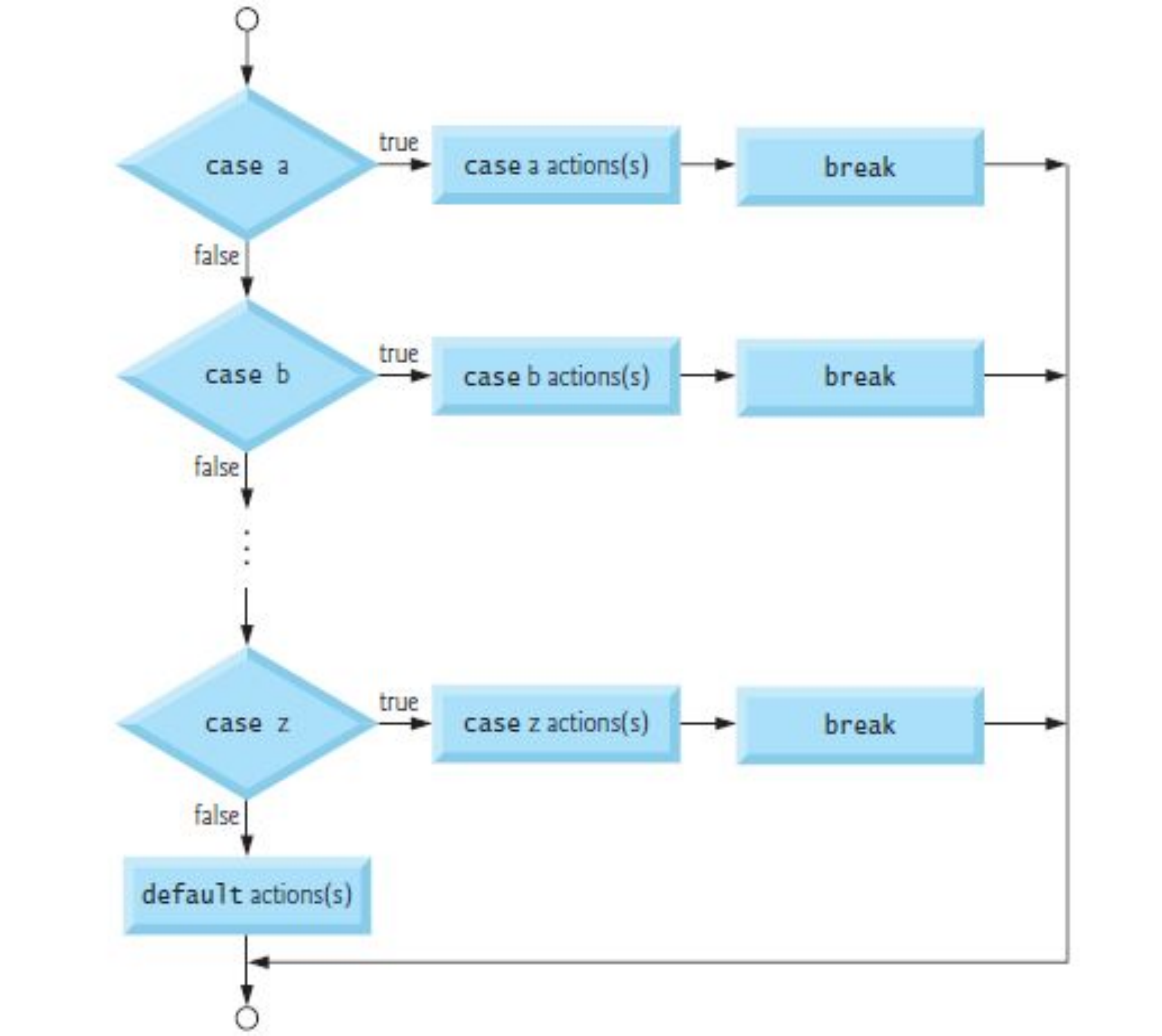
```
   if (a>b)
       z = a;
   else
       z=b;
```

The switch Statement

The C switch is similar to Pascal's case statement and it allows multiple choice of a selection of items at one level of a conditional where it is a far neater way of writing multiple if statements:

```
switch (expression) {
        case item1:
              statement1;
              break;
        case item2:
              statement2;
              break;
                                                      case itemn:
              statementn;
              break;
        default:
              statement;
              break;
       }
```

Flowchart of switch statements



The switch Statement (con't)

- In each case the value of *item* must be a constant, variables are not allowed.
- The break is needed if you want to terminate the switch after execution of one choice. Otherwise the next case would get evaluated.
- We can also have null statements by just including a : or let the switch statement *fall through* by omitting any statements (see *e.g.* next slide).

The switch Statement (con't)

For example:-

```
switch (letter)
       {
        case `A':
        case `E':
        case `I':
        case `O':
        case `U':
              numberofvowels++;
              break;

        case ` ':
              numberofspaces++;
              break;

        default:
              numberofconstants++;
              break;
       }
```

The switch Statement (con't)

- In the above example if the value of letter is `A', `E', `I', `O' or `U` then numberofvowels is incremented.
- If the value of letter is ` ' then numberofspaces is incremented.
- If none of these is true then the default condition is executed, that is numberofconstants is incremented.

The Tips and Traps

- You can put the cases in any order you please.
- If there are multiple statements to be executed in each case there is no need to enclose them within a pair of braces (unlike if, and else).
- Not allowed:
  - case i <= 20 :
  - case 2.5:
  - case a+b:
- Legal expressions:
  - switch (i + j * k)
  - switch (23 + 45 % 4 * k)
  - switch (a < 4 && b > 7)

Class assignment
Marks: 02

- Write a program which reads two integer values. If the first is less than the second, print the message up. If the second is less than the first, print the message down If the numbers are equal, print the message equal.exit(0). [use switch case only]

Exercise (Class Work)

- Read an integer value. Assume it is the number of a month of the year; print out the name of that month.
- Write a program which reads two integer values. If the first is less than the second, print the message up. If the second is less than the first, print the message down If the numbers are equal, print the message equal If there is an error reading the data, print a message containing the word Error and perform exit(0).

Exercise (Home Work)

- If the ages of Wasim Akram, Javaid Miandad and Imran Khan are input through the keyboard, write a program to determine the youngest of the three.
- Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees.