# CS & IT ENGINEERING

## C Programming

### Control Statements

Lecture No.- 01

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# Recap of Previous Lecture

- I/O Functions
  - Formatted i/o functions
    - scanf( )
    - Printf( )

# Topics to be Covered

- Control Statement ?
- Types of Control Statements
- Conditional Control Statements

# Topic : Conditional Control Statements - 1

Ex:

```
1.  Void main ( )                          // Function definition
    {
2.      int i, j, k;                       // Variable Declaration
3.      Printf (" Enter i, j values");     // Output statement
4.      Scanf (" %d %d", &i, &j);          // input statement
5.      k= i * j + i % j;                  // Computational Assignment
6.      Printf (" k value is %d", k);      // Output statement
    }
```

main() function Block

Sequence of Execution : 1 → 2 → 3 → 4 → 5 → 6

order of write-up

# Topic : Conditional Control Statements - 1

## Control Statement :

- A Statement, that can change (Control) the order (Sequence) of Execution of other Statements.

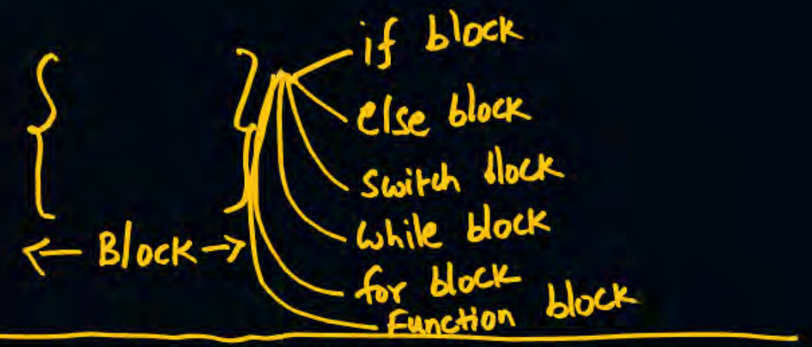
- There are 3 Types of Control Statements :

1) Conditional (or) Selection (or) Decision-Making Control Statements
   - if, Nested if, if-else, Nested if-else, if-else-if Ladder, Switch

2) Iterative (or) Looping Statements
   do-while, while, for

3) Jumping Statements (or) Un Conditional Control Statements
   break, goto, Continue, return

# Topic : Conditional Control Statements - 1




## Conditional Control Statements

- The sequence of execution, depends on result of Expression(s).
- if, if-else, switch are Conditional Control Statements.

**if Statement** : if block of statements Executed only when Expression results TRUE.

**Syntax:**

```
if( Expression)
{
    Statement 1 ;
    Statement 2 ;
    :
}
```

**NOTE**: When only 1 statement in the block, Then { } are optional.

# Topic : Conditional Control Statements - 1

Examples :

① 
```
1  Void main() {
2     int i;
3     scanf("%d", &i);
4     if ((i > 7) && (i % 2 == 1))
5           Printf("GOOD");
   }
```

**Test Case 1:**

input (i value) : 21

(21 > 7) && (21 % 2 == 1)

TRUE && TRUE

TRUE

O/P: GOOD ⇒ Sequence : 1, 2, 3, 4, 5

**Test Case 2**

input (i value) : 14

(14 > 7) && (14 % 2 == 1)

TRUE && FALSE

FALSE

O/P: No output Sequence : 1, 2, 3, 4

**Test Case 3**

input (i value) : 5

(5 > 7) && (5 % 2 == 1)

FALSE && TRUE

FALSE

O/P: No output Sequence : 1, 2, 3, 4

# Topic : Conditional Control Statements - 1

**Ex: 2 :** O/P = ____

```
Void main( ){
   if( Printf("HELLO") )
      Printf("HAI");
}
```

if( Printf("HELLO") ) ⇒ if (5) ⇒ if(Non Zero) = TRUE

O/P: HELLOHAI

a) ERROR
b) HAI
c) HELLO
d) HELLOHAI

**Ex: 3** output ?

```
Void main( ){
   if( Printf("") )
      Printf("HAI");
}
```

Printf("") returns 0 ⇒ if(0) = False

Printf("HAI") Prints Nothing

a) HAI
b) Error
c) No output
d) None

# Topic : Conditional Control Statements - 1

**Ex: 4** o/p = _____

```
int i;
if( scanf("%d", &i))
    Printf(" HAI");
}
```

returns 1 ⇒ if(1) = TRUE

scanf → Accepts input and return Number of inputs accepted.

input (i value) = 0

a) HAI
b) 0 HAI
c) No output
d) Error

**Ex: 5** o/p = _____

```
int i;
if((Printf("%d", i)) && scanf("%d", &i))
    Printf("HAI");
    Printf("BYE"); // Not Inside if. So, it always Execute
```

Printf → Prints Garbage Value ⇒ Non zero = True, zero = True

scanf return value will 1

Let input, i value = 41

a) 4
b) _ HAI BYE
c) HAIBYE
d) BYE

# Topic : Conditional Control Statements - 1

## if-else

Syntax:

```
if(Expression)
{
    Statement
    :
}
else
{
    Statement;
    :
}
```

// TRUE

// FALSE

NOTE: { } is optional for Single Statement

## Examples :

① 
```
int i=7, j=5, k=0;
if( (i>j) || (j>k))
    Printf("GOOD");
else
    Printf("BAD"); // ignored
```

o/p= GOOD

(7>5) || (5>0)

TRUE || TRUE

TRUE

② 
```
int i, j;
scanf("%d %d", &i, &j);
if((i%3==0) && (i/2 != 4))
    Printf("GOOD");
    Printf("BAD");
else
    Printf("VERY BAD");
```

// Misplaced

if has only This Print Statement

o/p= _____ if inputs = 15, 8

a) GOOD BAD
b) GOOD
c) VERY BAD
d) Error // misplaced else

NOTE: else should immediately followed by if.

Ex: 3

```
int i=1, j=0;

if(i--, j++)
    printf("%d %d", ++i, ++j);
else
    printf("%d %d", --i, --j);
```

o/p = _____

a) 1, 0
b) 1, 2
c) -1, 0
d) 2, 2

if(1, 0) ≡ if(0) = False → Right most Value for Decision Making.

# 2 mins Summary

- What is Control Statement ?
- Types of Control Statements
- Conditional Control Statements
  - if
  - if-else

# THANK - YOU