If-else Statement

The most used decision making Statement

Courtesy to Lec Tasneem Mubashshira, MIST

Four Types of Control Statement:

1. Decision making statements
2. Selection statements
3. Iteration statements
4. Jump statements

Decision making statements

The decision making statement may be implemented in different forms

- Simple if statement
- if….else statement
- elseif ladder
- Nested if….else statement

Decision making statements

If – else is the main decision making statement.

- **Syntax:**

```
if(condition){
   statement 1;
   statement 2;
}
```

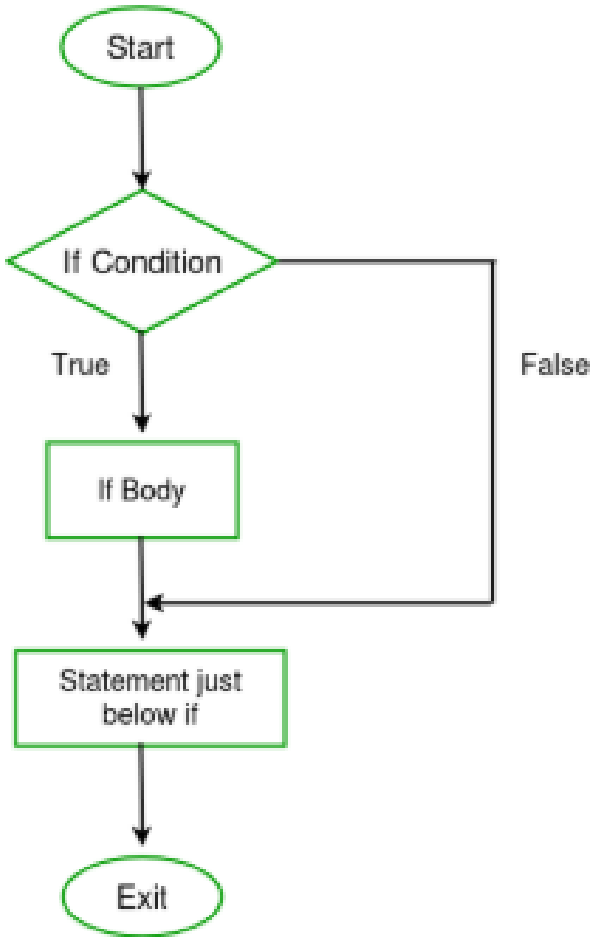
Decision making statements

If – else is the main decision making statement.

- The if statement evaluates the condition inside the parenthesis ().
- If the condition is true, statements inside the body of if are executed.
- If the condition is false, statements inside the body of if are not executed.

Take one integer input greater than 10 and show if the user followed the instruction or not.

```c
#include<stdio.h>
int main() {
    int i;
    printf("Enter an integer grater than 10\n");
    scanf("%d",&i);
    if(i>10){
        printf("You followed the instruction correctly\n");
    }
    printf("program ends");
}
```

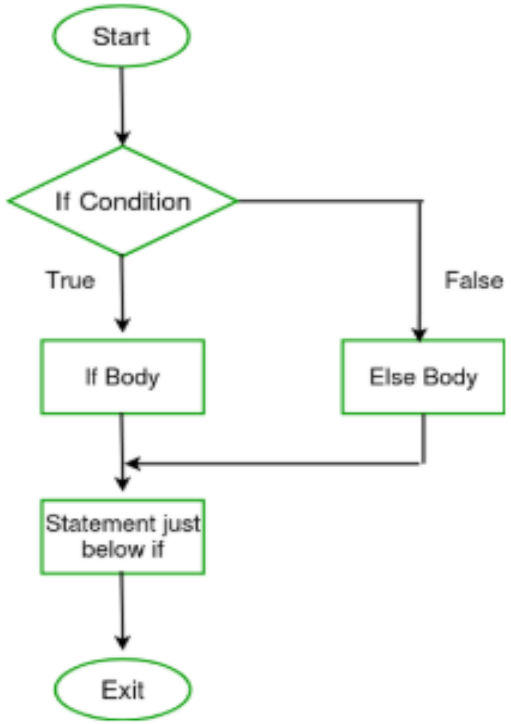


Decision making statements

If – else is the main decision making statement.

- **Syntax:**

```
if(condition){
   statement 1;
   statement 2;
}
else{
   statement 3;
   statement 4;
}
```



Decision making statements

If – else is the main decision making statement.

- The if statement evaluates the condition inside the parenthesis ().
- If the condition is true, statements inside the body of if are executed and statement inside the body of else is skipped.
- If the condition is false, statements inside the body of else are executed and statement inside the body of if is skipped.

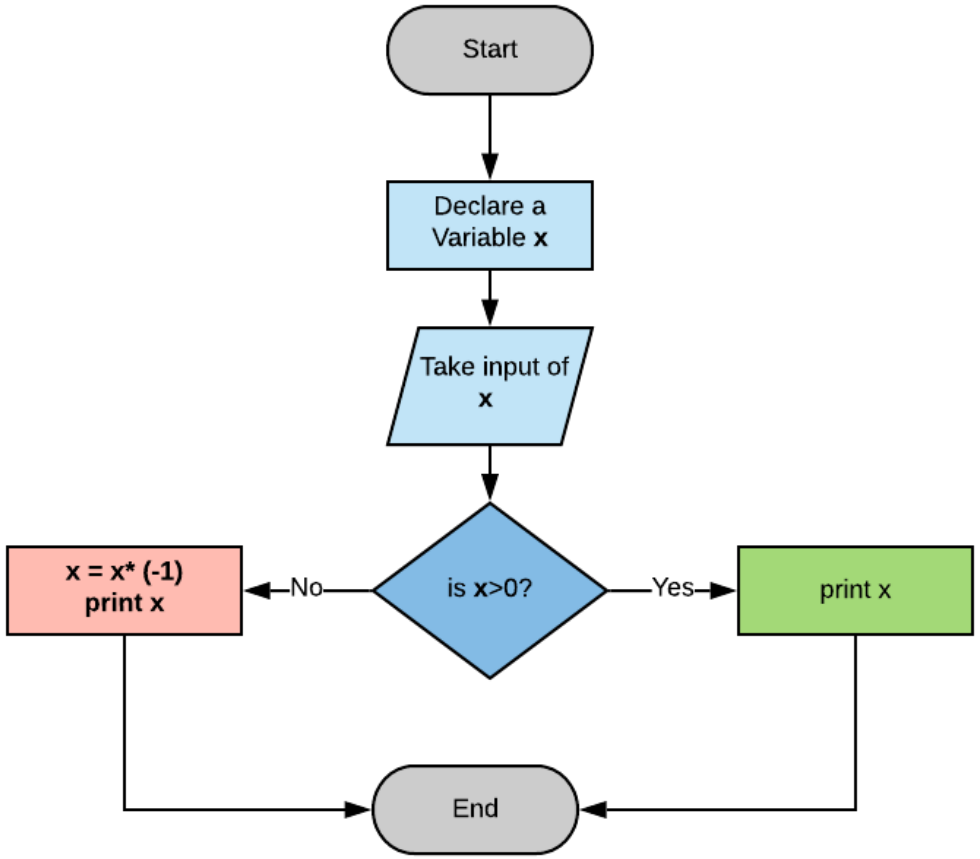
Take input of a number and print its absolute value.

Steps:

1. First we have to declare a variable **x**
2. Take input of that variable **x**
3. Check if it is grater than zero
4. If yes, then do nothing, just print the value
5. If no, then multiply it by -1 and print the value

- **Code Representation:**

```
#include<stdio.h>
int main() {
    int x;
    printf("Enter an integer \n");
    scanf("%d",&x);
    if(x>0){
        printf("Absolute value is: %d\n",x);
    }
    else{
            x= x*(-1);
    printf("Absolute value is: %d",x);
    }
}
```

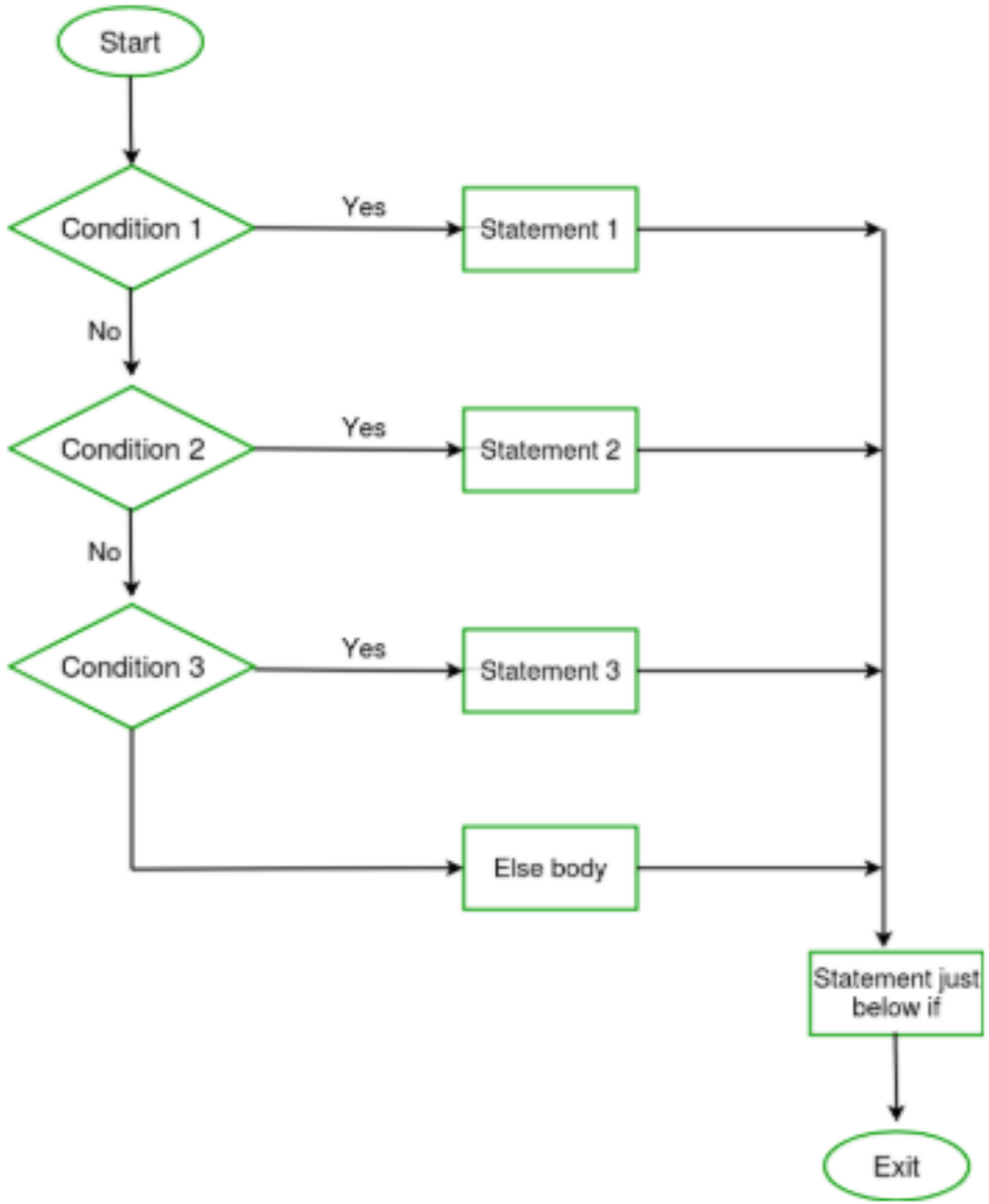


Decision making statements

else – if ladder is used when we need to check multiple conditions.

Syntax:

```
if(condition){
   statement 1;
}
else if(condition){
   statement 2;
}
else{
   statement 3;
}
```


Start
Condition 1
Yes
Statement 1
No
Condition 2
Yes
Statement 2
No
Condition 3
Yes
Statement 3
Else body
Statement just below if
Exit

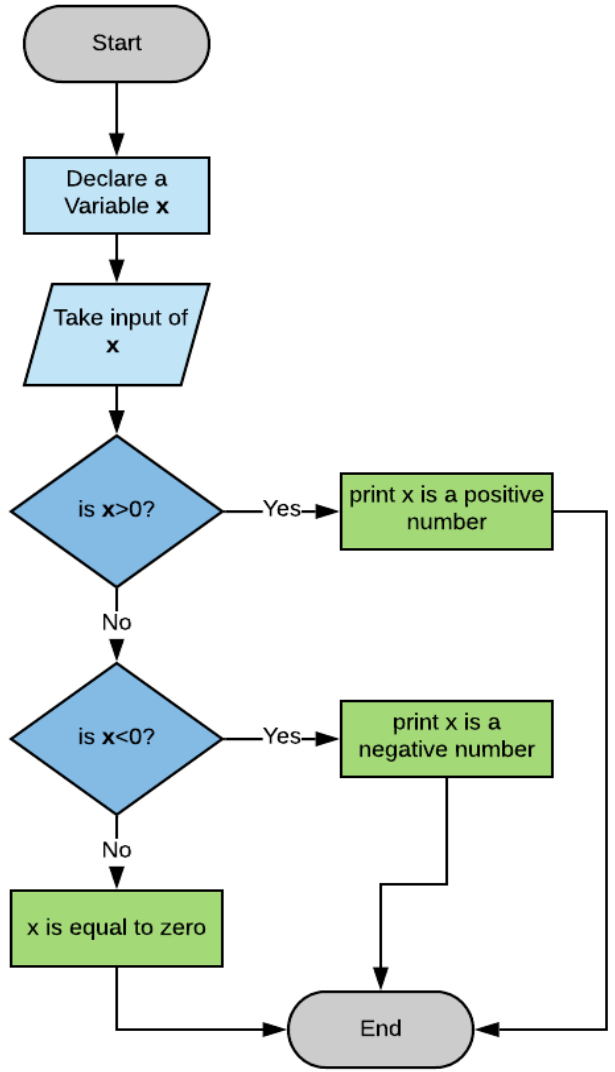
Take input of a number and test whether it is a positive number or negative number.

Steps:

1. First we have to declare a variable
2. Take input of that variable
3. Check if it is grater than zero
4. If yes, then positive number
5. If no, then check if it is less than zero
    1. If yes, then negative number
    2. If no, then the number is zero

▪**Code Representation:**

```
#include<stdio.h>
int main() {
    int x;
    printf("Enter an integer \n");
    scanf("%d",&x);
    if(x>0){
        printf("x is a positive number\n");
    }
    else if(x<0){
            printf("x is a negative number");
    }
    else{
            printf(“x is equal to zero”);
            }
}
```



Practice Problems

- Take input of a number and test whether it is an **odd number** or **even number**
- Take input of a number and print the absolute value of it
- Take input of 2 numbers and find the **maximum number**
- Take input of two integer numbers a, b and show whether **a** is **divisible by b** or not.
- Take input of a character and print whether it is **uppercase** or **lowercase**

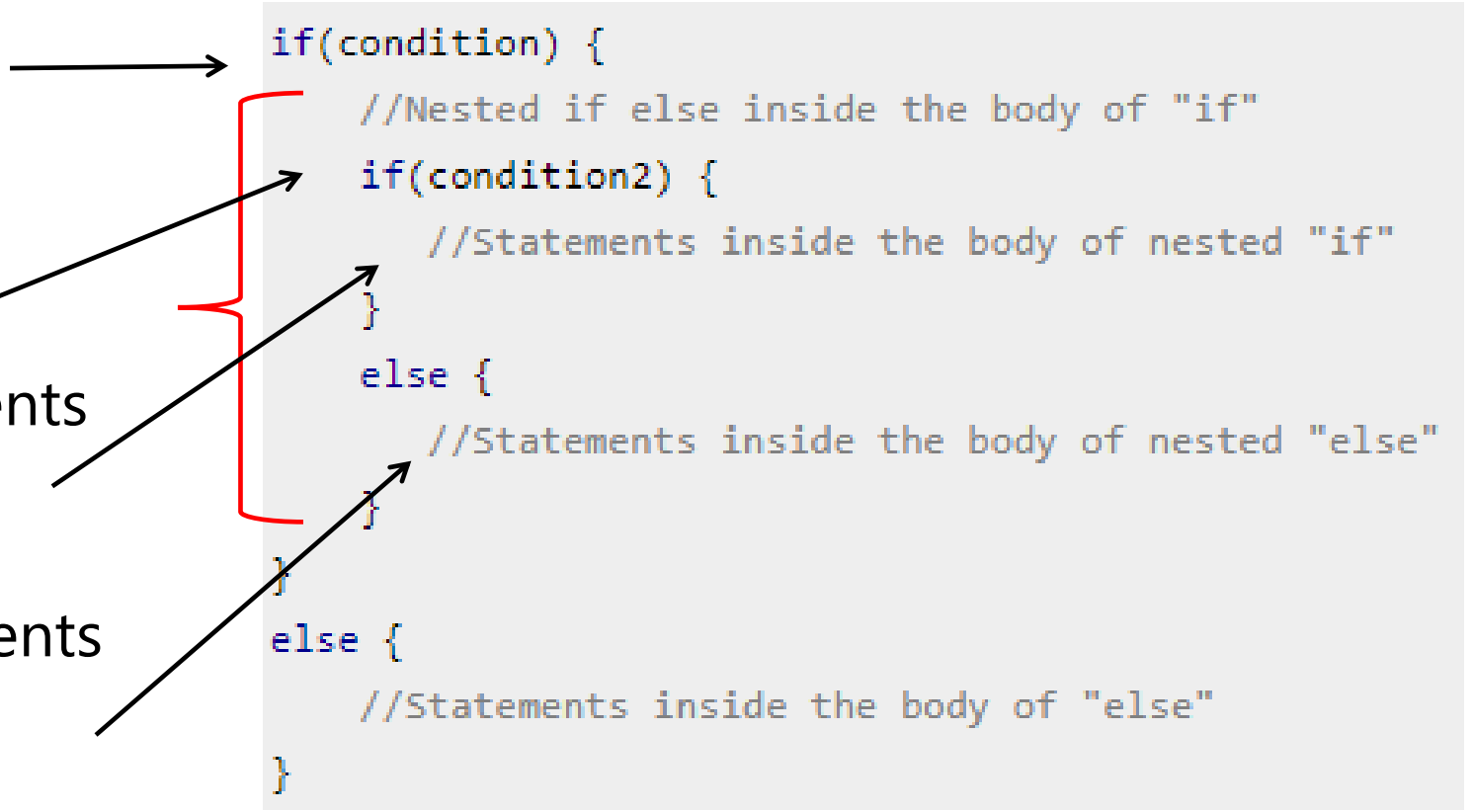
When an if else statement is present inside the body of another “if” or “else” then this is called **nested if else**.

- This condition will be evaluated first.
- If the condition is false, statements inside the body of else are executed

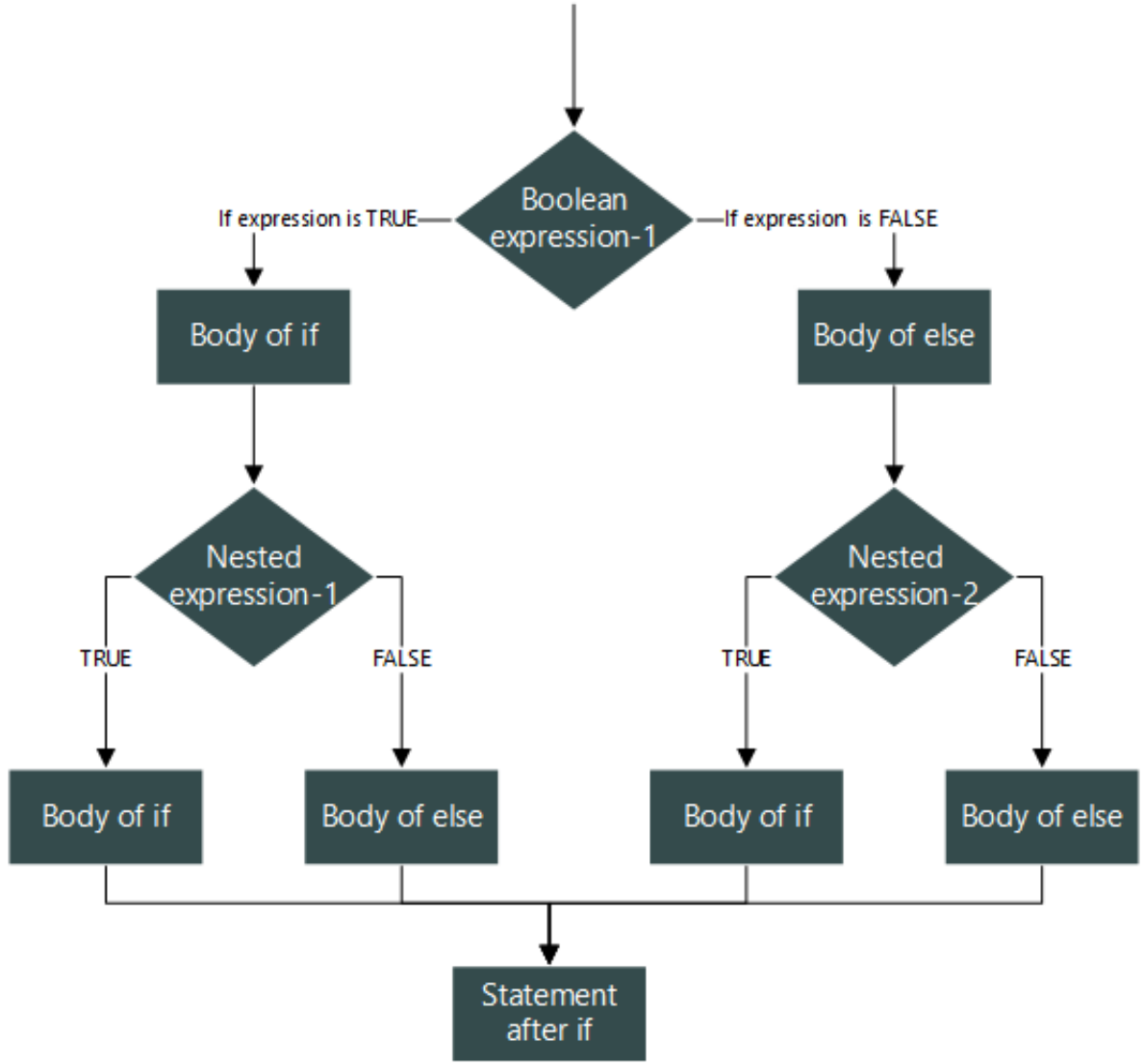
```
if(condition) {
    //Nested if else inside the body of "if"
    if(condition2) {
       //Statements inside the body of nested "if"
    }
    else {
       //Statements inside the body of nested "else"
    }
}
else {
    //Statements inside the body of "else"
}
```

Nested If-else Execution Sequence

- If the condition is true, statements inside the body of if are executed
- Then this condition2 will be evaluated.
- If condition2 is true, statements inside the body of if are executed
- If condition2 is false, statements inside the body of else are executed



```
if(condition) {
    //Nested if else inside the body of "if"
    if(condition2) {
        //Statements inside the body of nested "if"
    }
    else {
        //Statements inside the body of nested "else"
    }
}
else {
    //Statements inside the body of "else"
}
```


Boolean expression-1
If expression is TRUE
If expression is FALSE
Body of if
Body of else
Nested expression-1
Nested expression-2
TRUE
FALSE
TRUE
FALSE
Body of if
Body of else
Body of if
Body of else
Statement after if

Take input of an integer number and test whether it is positive, negative or zero.

Use nested – if else

Find out the maximum between three integer numbers

Practice Problems

- Write a C program to check whether a triangle can be formed by the given value for the angles.
- Write a C program to check whether a triangle can be formed by the given value for the sides.
- Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene.
- Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies. Also find out if the point is on the x or y axis. Or if the point is origin/center point itself!

Ternary Operator

? : Operator or Ternary Operator

- The **? : operator** is just like an if … else statement
- Every problem we solve using if-else statement, can be solved by using ternary operators
- **? :** is a ternary operator, so it takes three values, this is the only ternary operator C has.

- **if condition is true ? then X return value : otherwise Y value;**

Ternary Operator Syntax

condition? If true then return X : if false return Y;



Example:

```
(var%2)==0?     printf("even number")     : printf ("odd number") ;
```

Useful Study Links

https://www.w3resource.com/c-programming-exercises/conditional-statement/index.php