Decision making:

Conditional statements:

- **if**
- **if….else**
- ?: operator (conditional / ternary operator)
- Switch…case

If else statement.

```
If(condition)
   {statement1;
   statement2; }
   else
   { statement1;
statement2;}
```

Relational operators

==	equal to
!=	not equal to
>	greater than
<	less than
>=	greater than equal to
<=	less than equal to

EXAMPLE: IF..ELSE

```
if(age >=18)
                printf("You are eligible for voting");
if(age < 18)
                printf("You are not eligible for voting");
```

OR

```
if(age >=18)
                printf("You are eligible for voting");
else
                printf("You are not eligible for voting");
```

Program for simple problem

```
float income, tax;
scanf("%f", &income);

if(income <= 180000)
        printf("No tax owed.");

if(income > 180000)
        printf("You owe tax.");
```

Better program for simple problem

```
float income, tax;
scanf("%f", &income);

        if(income <= 180000)
                printf("No tax owed.");
        else
                printf("You owe tax.");
```

Code for Even /Odd number code

```
#include<stdio.h>
int main()
   {
       int n, a;
       a=n%2;

       if(a!=0)
                printf("number is odd");
        else
                printf("number is even");

return 0;
}
```

EXCHANGING BLOCKS

```
main( )
{
   int a = 3, b = 4 ;
   if ( a <= b )
         printf ( "A" ) ;
   else
         printf ( "B" ) ;
}
```

Output: A

```
main( )
{
      int a = 3, b = 4;
      if ( a > b )
            printf ( "B" ) ;
      else
            printf ( "A" ) ;
}
```

Output: A

Logical Operators

!	NOT (!a)
&&	AND (a&&b)
||	OR (a||b)

Working of && And | |

cond1	cond2	cond1 && cond2	cond1 | | cond2
True	True	True	True
False	False	False	False
True	False	False	True
False	True	False	True

```
if(age>25 && salary>40000)
printf(“  bonus=10000  ”);

else if(age>25 || salary>40000)
printf(“  bonus= 5000 ”);

else
   printf(“  no bonus  ”);
```

PROGRAM TO RELATE TWO INTEGERS USING =, > OR <

```
if (n1 == n2)
{
        printf("Numbers are equal");
}
else if(n1 > n2)
{
        printf("n1 is greater");
}
else
{
        printf("n2 is greater");
}
```

```
int m1, m2, m3, m4, m5, per ;
printf ( "Enter marks in five subjects " ) ;
scanf ( "%d %d %d %d %d", &m1, &m2, &m3, &m4, &m5) ;

per = ( m1 + m2 + m3 + m4 + m5 ) / 5 ;

if ( per >= 60 )
        printf ( "First division" ) ;
else if ( ( per >= 50 ) && ( per < 60 ) )
        printf ( "Second division" ) ;
else if ( ( per >= 40 ) && ( per < 50 ) )
        printf ( "Third division" ) ;
else
        printf ( "Fail" ) ;
```

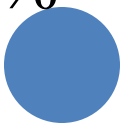
FIND LARGEST OF 3 NUMBERS

```
if (n1>=n2)
{
        if(n1>=n3)
            printf(" %d ", n1);
        else
            printf(" %d ", n3);
}
else
{
        if(n2>=n3)
            printf(" %d ", n2);
        else
            printf(" %d ", n3);
}
```

Let us calculate income tax

Write a program to read income and print income tax, using following rules.

- If income ≤ 1,80,000, then tax = 0.
- If income is between 180,000 and 500,000 then tax = 10% of (income - 180,000).
- If income is between 500,000 and 800,000, then tax = 32,000 + 20% of (income – 500,000).
- If income > 800,000, then tax = 92,000 + 30% of (income – 800,000).



Tax calculation program

```
float tax,income;
scanf("%f", &income);

 if (income <= 180000) tax = 0;
 else if(income <= 500000)
     tax = (income – 180000) * 0.1;
 else if(income <= 800000)
     tax = (income – 500000) * 0.2 + 32000;
 else tax = (income – 800000) * 0.3 + 92000;

 printf("%f", tax);
```

Decision making:

Conditional statements:

if

if….else

?: operator (conditional / ternary operator)

switch…case

Condition operator

Condition operator is ?

Syntax:
expression1 ? Expression2 : expression3

EXAMPLE

```
int x, y ;
scanf ( "%d", &x ) ;
y = ( x > 5 ? 3 : 4 ) ;
```


```
if ( x > 5 )
 y = 3 ;
else
  y = 4 ;
```

EXAMPLES

```
a > b ? g = a : g = b;
```

Leap year:

```
(year%4==0 && year%100!=0) ? printf("LEAP YEAR")
   : (year%400 ==0 ) ? printf("LEAP YEAR") :
   printf("COMMON YEAR");
```

SWITCH-CASE

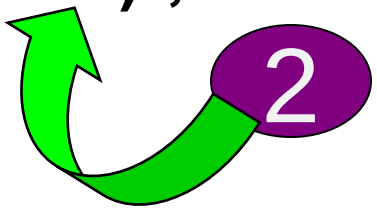
The control statement that allows us to make a decision from the number of choices

```
switch ( integer expression )
{
   case constant 1 :
         do this ;
   case constant 2 :
         do this ;
   case constant 3 :
         do this ;
   default :
         do this ;
}
```

If match found program executes the statements following that **case,** and all subsequent **case and default statements as well.**

If no match is found with any of the **case statements, only the** statements following the **default are executed.**

```
main ( )
{
    int n ;
    scanf ( ”%d”, &n ) ;
    switch ( n )
    {
        case 1 :
            printf ( ”You entered 1” ) ;
        case 2 :
            printf ( ”You entered 2” ) ;
        case 3 :
            printf ( ”You entered 3” ) ;
        default :
            printf ( ”Wrong choice” ) ;
    }
}
```



Output:

You entered 2

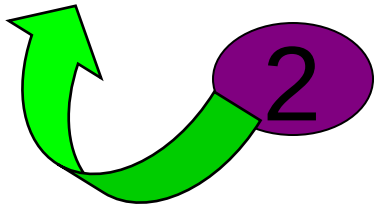
You entered 3

Wrong choice

Tip: If a *case* is satisfied all statements below it are executed

The Solution

```
main ( )
{
    int n ;
    scanf ( ”%d”, &n ) ;
    switch ( n )
    {
          case 1 :
             printf ( ”You Entered 1” ) ;  break ;
          case 2 :
             printf ( ”You Entered 2” ) ;  break ;
          case 3 :
             printf ( ”You Entered 3” ) ;  break ;
          default :
             printf ( ”Wrong choice” ) ;
    }
}
```



OUTPUT:
You Entered 2

Tip: Order of *cases* is unimportant

```
main ( )
{
    int n ;
    scanf ( ”%d”, &n ) ;
    switch ( n )
    {
        case 2 :
            printf ( ”You Entered 2” ) ; break ;
        case 1 :
            printf ( ”You Entered 1” ) ; break ;
        case 3 :
            printf ( ”You Entered 3” ) ; break;
         default :
            printf ( ”Wrong choice” ) ;
    }
}
```

Tip: *default* case is optional

```
main ( )
{
    int n ;
    scanf ( ”%d”, &n ) ;
    switch ( n )
    {
        case 2 :
            printf ( ”You Entered 2” ) ;  break ;
        case 1 :
            printf ( ”You Entered 1” ) ;  break ;
        case 3 :
            printf ( ”You Entered 1” ) ;
    }
}
```

```
main( )
{
    char ch ;
    printf ( ”Enter alphabet between A and C” ) ;
    scanf ( ”%c”, &ch ) ;
    switch ( ch )
    {
        case ’A’:
            printf ( ”You entered A” ) ;
            break ;

        case ’B’:
            printf ( ”You entered B” ) ;
            break ;

        case ’C’:
            printf ( ”You entered C” ) ;
            break ;
    }
}
```

```
main( )
{
    char ch ;
    printf ( ”Enter alphabet between A and C” ) ;
    scanf ( ”%c”, &ch ) ;
    switch ( ch )
    {     case ’a’ :
          case ’A’:
                printf ( ”You entered A” ) ;
          break ;
          case ’b’ :
          case ’B’:
                printf ( ”You entered B” ) ;
                break ;
          case ’c’ :
          case ’C’:
                printf ( ”You entered C” ) ;     break ;
    }
}
```