C in One Shot

Part – 2

Ques : Take positive integer input and tell if it is even or odd

$$n \% 2 \rightarrow 0$$

$$\downarrow$$

n is divisible by 2

↳ n is even

Input	Output
5	Odd
6	Even
2	Even

Any no. which is divisible by 2 is called even

```c
#include <stdio.h>
int main(){
    int n;
    printf("Enter a number : ");
    scanf("%d",&n);
    if(n%2==0){
        printf("Even number");
    }

    return 0;
}
```

Output

Enter a number : 7

7
n

If - Else

$n \to 6$

```
if (n%2 == 0) {

    printf("Even Number");
}

if (n%2 != 0) {

    print("Odd Number");

}
```

Ques : Take positive integer input and tell if it is divisible by 5 or not.

HW : Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not. (Considering leap year occurs after every 4 years)

Classwork   2000   2004   2008   2012   2016   2020

2022   2026

Ques : Take integer input and print the absolute value of that integer

Negetive , Positive , Zero

$7 \rightarrow 7$

$-8 \rightarrow 8$

$-450 \rightarrow 450$

```c
#include <stdio.h>
int main(){
    int n;
    printf("Enter a number : ");
    scanf("%d",&n);
    if(n<0){ // if n is negetive
        n = n * (-1);
    }
    printf("The absolute value is  : %d",n);


    return 0;
}
```

Output

Enter a number : -6

The absolute value is 6

$$n = -6 * (-1) = 6$$

Ques : If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss he incurred.

```
int cp;
int sp;
scanf()
```

$$SP > CP \quad (Profit)$$

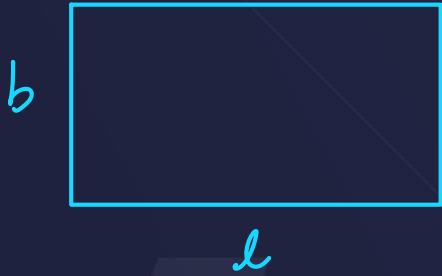$$CP > SP \quad (loss)$$

```c
int cp; // dabba
printf("Enter cost price : ");
scanf("%d",&cp);
int sp; // dabba
printf("Enter selling price : ");
scanf("%d",&sp);
if(sp>cp){        10 > 10  ✗
    printf("Profit");
}
else{    →    CP ≥ SP
    printf("Loss");
}
```


CP   SP
10   10

Output

Enter cost price : 10

Enter selling price : 10

Ques : Given the length and breadth of a rectangle, write a program to find whether the area of the rectangle is greater than its perimeter.

$$A = \ell b$$
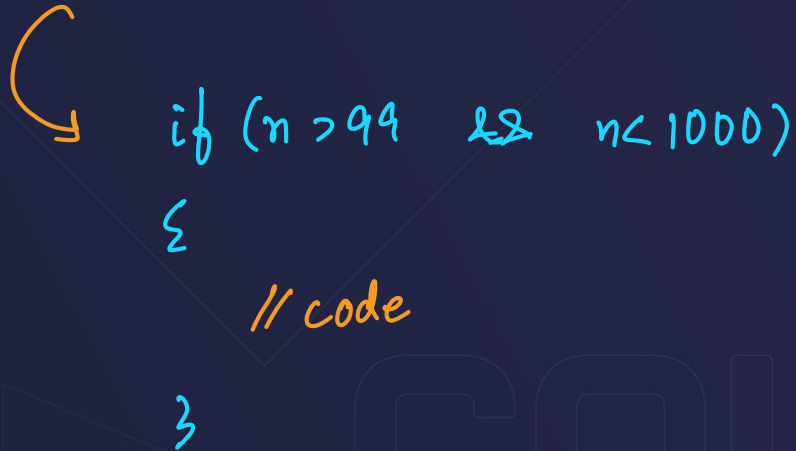
$$P = 2(\ell + b)$$

b

ℓ

Multiple Conditions Using && and ||

Ques : Take positive integer input and tell if it is a three digit number or not.

$$n > 99 \quad \text{and} \quad n < 1000$$

```
if (n > 99  &&  n < 1000)
{
    // code
}
```

Ques : Take positive integer input and tell if it is divisible by 5 and 3.

H.W.

if $(n \% 5 == 0 \quad \&\& \quad n \% 3 == 0)$

$\{$

$\}$

15 se divisible

Ques : **Take positive integer input and tell if it is divisible by 5 or 3.**

$$3, 5, 6, 9, 10, 12, 15, 18, 20, 21$$

'||' operator

Ques : Take 3 positive integers input and print the greatest of them. (all 3 are distinct)

a, b, c

if (a > b && a > c) { → a is greatest

    printf ( )

}

if (b > a && b > c)   b greatest

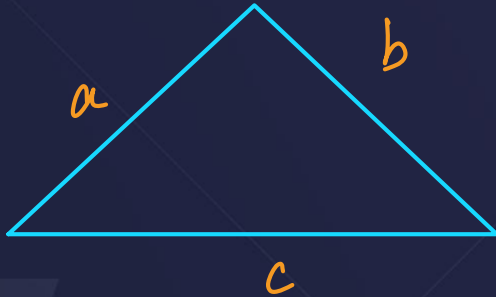H.W.   Take 4 positive integers input & print the greatest.

a, b, c, d   if (a > b && a > c && a > d)

HW : If the ages of Ram, Shyam and Ajay are input through the keyboard, write a program to determine the youngest of the three.

Ques : Take 3 numbers input and tell if they can be the sides of a triangle.

a, b, c

$a + b > c$

$b + c > a$

$a + c > b$

Nested If - Else

if else ke andar if

Ques : Take positive integer input and tell if it is divisible by 5 or 3 but not divisible by 15.

```
int   n;

    if (n% 5 == 0   ||   n%3 == 0)
```

3 , 5 , 6 , 9 , 10 , 12 , 18 , 20 , 21 , 24 , 27 , 33

```c
// }
if(n%5==0 || n%3==0 && n%15!=0){
    printf("the number is divisible by 5 or 3 but not fifteen");
}
else{
    printf("the number is not matching the required condition");
}
return 0;
```

&& ⟶ ||

n=15

Concept of Heirarchy → BODMAS → B, O, D/M, A/S

n % 5 == 0 || n % 3 == 0 && n % 15 != 0

True

True

False

False

True

False

(n % 5 == 0 || n % 3 == 0) && n % 15 != 0 → False

True   True → True   False

Ques : Take positive integer input and tell if it is divisible by 5 and 3.

```
if (n % 5 == 0){
    if (n % 3 == 0){

    }
}
```

Difference b/w '=' and '=='

n = 2; → assigning →

n = 7; → Update

n == 2;
↓
True , False

if (n == 2){

}

True

if (n = 2){

}

Conditions

$$\begin{bmatrix} 7 \\ \cancel{2} \end{bmatrix}$$
n

1) a == b

2) a > b

3) a < b

4) a >= b

5) a <= b

Ques : Take 3 positive integers input and print the greatest of them.

a, b, c

S 3 1

if (a > b) {
    if (a > c)
        a is greater
    else
        c is greatest
}

```
scanf("%d", &c);
if(a>b){ // b is out of race
    if(a>c)
        printf("%d is greatest",a);
    else // a<c    ->   b < a < c
        printf("%d is greatest",c);
}
else{ // b > a   ->   a ab sabse bada to nahi hai
    if(b>c)
        printf("%d is greatest",b);
    else // c>b   ->   a<b<c
        printf("%d is greatest",c);
}
```

HW : If the ages of Ram, Shyam and Ajay are input through the keyboard, write a program to determine the youngest of the three.

Nested Loops se →

Else If

sp , cp

```c
if(sp>cp){
    printf("Profit");
}
else if(cp>sp){
    printf("Loss");
}
else{
    printf("No profit, no loss");
}
```

Ques : Take input percentage of a student and print the Grade according to marks:

int n;

91

1) 90–100 Excellent
2) 80–90 Very Good
3) 70–80 Good
4) 60–70 Can do better
5) 50–60 Average
6) 40–50 Below Average
7) <40 Fail

if (n > 91 && n < 100)
    printf(Exe ..)

if (n > 81 && n < 91)

Maths

Ques : Given three points (x1, y1), (x2, y2) and (x3, y3), write a program to check if all the three points fall on one straight line.

$$double \; x1, y1, x2, y2, x3, y3;$$

$$double \; m1 = (y2-y1)/(x2-x1);$$

(x3, y3)

C

(x2, y2)

B

(x1, y1)

A

Slope (BC)

$$\frac{y3-y2}{x3-x2} = m2$$

Slope (AB)

$$\boxed{\frac{y2-y1}{x2-x1} = m1}$$

if (m1 = m2)
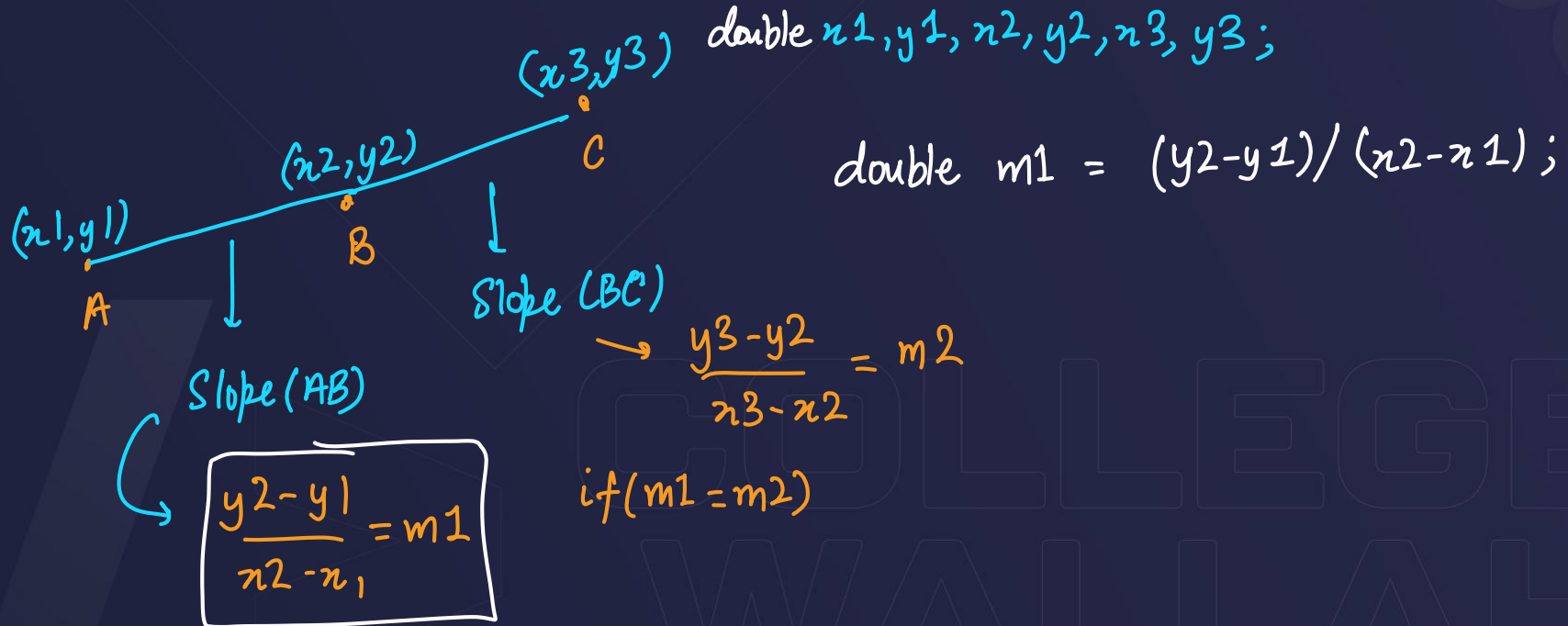
Ques : Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin, viz. (0, 0).

```
if ( lies on x-axis ) {

}
else if ( lie on y ) {

}
else {

}
```
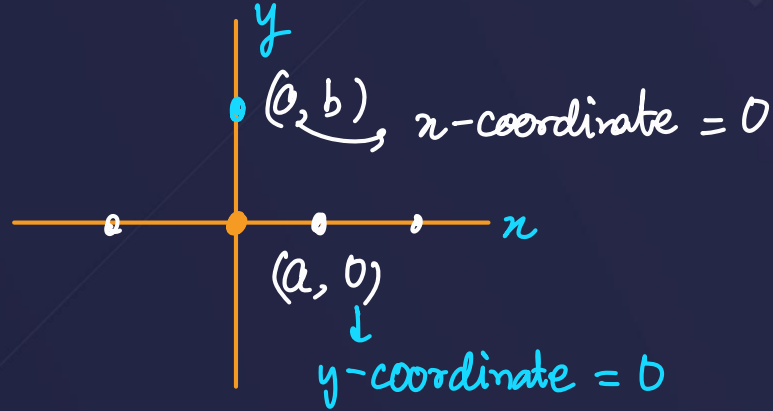

$(0, b)$, x-coordinate = 0

$(a, 0)$

y-coordinate = 0

Ternary Operator

Cool Banne

expression 1 ? expression 2 : expression 3

Predict the Output

MCQ Time !

Predict the output

```
main( ) {
    int x = 10, y = 20 ;
    if ( x == y ) ;
        printf ( "\n%d %d", x, y ) ;
}
```

10   x
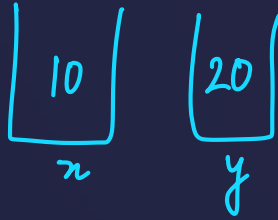
20   y

independent of the above 'if' statement

- 10 20

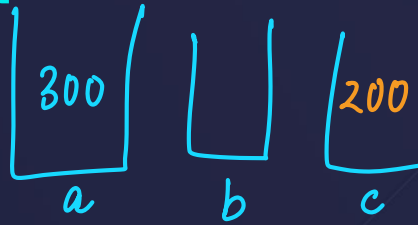# Predict the output

```
main( ) {
    int a = 300, b, c ;
    if ( a >= 400 )
        b = 300 ;
    c = 200 ;
    printf ( "\n%d %d", b, c ) ;
}
```

300   200

a   b   c

Output

-
- G   200
  ↳
  garbage value

uninitialized variable

Predict the output

```
main( ) {
    int x = 3, y = 5 ;
    if ( x == 3 )
        printf ( "\n%d", x ) ;
    else ;
        printf ( "\n%d", y ) ;
}
```

Output

- 3
- 5

3   →   x

5   →   y

Predict the output

```
main( ) {
    int x = 3 ;
    float y = 3.0 ;
    if ( x == y )
        printf ( "\nx and y are equal" ) ;
    else
        printf ( "\nx and y are not equal" ) ;
}
```
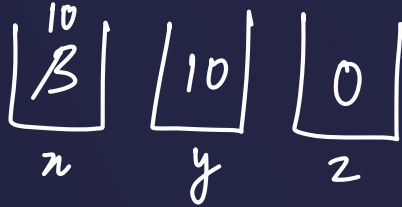
3 (x)

3.0 (y)

Output

-
- x and y are equal

*Predict the output

```
main( ) {
    ✓ int x = 3, y, z ;
    ✓ y = x = 10 ;
    z = x < 10 ;        → false → 0
    printf ( "\nx = %d y = %d z = %d", x, y, z ) ;
}
```

x | 10
y | 10
z | 0

Output

x = 10 y = 10 z = 0

Boolean :

bool x = true → 1
         false → 0

int x = 3;
printf ("%d", x = 10);

    ⎡ 10 ⎤
    ⎢ 3̶ ⎥
    ⎣   ⎦
       x

int x = 3;
print ("%d", x == 10);
                └──┘
                 ↓
              No → false

HW : Predict the output

```
main( ) {

    int a = 5, b, c ;

    b = a = 15 ;

    c = a < 15 ;

    printf ( "\na = %d b = %d c = %d", a, b, c ) ;

}
```

Predict the output

```
main( ) {

    int k = 35 ;

    printf ( "\n%d %d %d", k == 35, k = 50, k > 40 ) ;

}
```

50
3̶5̶
k

k == 35   true → 1

k > 40   true → 1

Output

-
- 1 5 0 1

HW : Predict the output

```
main( ) {

    int x = 15 ;

    printf ( "\n%d %d %d", x != 15, x = 20, x < 30 ) ;

}
```

Predict the output

```c
main( ) {
    int i = 65 ;
    char j = 'A' ;
    if ( i == j )
        printf ( "C is WOW" ) ;
    else
        printf( "C is a headache" ) ;
}
```

65 → i

'A' → j

Output

• C is WOW

HW : Predict the output

```
main( ) {

    int a = 500, b, c ;        Done

    if ( a >= 400 )

        b = 300 ;

        c = 200 ;

        printf ( "\n%d %d", b, c ) ;

}
```

The Real Thing:

if (condition)

    statement ;

if (expression)

    statement ;

The Real Thing:

if (3 + 2 % 5)

    printf ("This works") ;

if (a = 10)

    printf ("Even this works") ;

if (–5)

    printf ("Surprisingly even this works") ;

```
if (        ) ────→ true ────→ any no. except 0
{                                        ↓
   //code ✓                        any character
}
```

3 + [2 % 5]

    ↓

3 + 2   = 5

The Real Thing:

if (condition)

  statement ;

if (expression)

  statement ;