

if ($x > 0$)

{

printf (" No. is +ve");

{

else if ($x < 0$)

printf (" No. is -ve");

else

printf (" No. is zero");

{

d Nested If else-

if (c_1)

{

if (c_2)

Block A.

else if (c_3)

Block B

else

Block C.

{

Eg

```

1. int x=40;
printf ("Hi");
if (x << 2)
printf ("%d", x);
if (x = x << 1)
{
    printf ("Hello");
    printf ("%d", x);
}
else
{
    if (x == 0)
{
    printf ("Hey");
    x = x + 7;
}
else
{
    printf ("SeeA");
    x = x % 9;
}
printf ("Bye");
printf ("%d", x);
}

```

→ $x = 0;$
 $\rightarrow \text{Hi} \text{Hey Bye}.$

→ $x = -5;$ $\text{Hi}-5 \text{Hello-10-10}$

Q. WAP to input the coordinates of a point on a plane and check the quadrant in which lies.

```
#include <stdio.h>
int main()
{
    float x, y;
    scanf ("%f %f", &x, &y);
    if (x > 0) & y > 0)
        {
            if (y > 0)
                printf ("I quad");
            else if (y < 0)
                printf ("IV quad");
            else
                printf ("+ve x-axis");
        }
    else if (x < 0)
        {
            if (y > 0)
                printf ("II quad");
            else if (y < 0)
                printf ("III quad");
            else
                printf ("-ve x-axis");
        }
    else
        {
            if (y > 0)
                printf ("+ve y-axis");
            else if (y < 0)
                printf ("-ve y-axis");
            else
                printf ("origin");
        }
}
```

Q. WAP to input 3 no. and find largest among them.

```
#include <stdio.h>
```

```
int main()
```

```
{ int a, b, c;
```

```
scanf ("%d %d %d", &a, &b, &c);
```

```
if (a >= b)
```

```
{
```

```
if (a >= c)
```

```
{ printf ("%d", a);
```

```
else
```

```
printf ("%d", c);
```

```
}
```

```
else
```

```
{
```

```
if (b >= c)
```

```
printf ("%d", b);
```

```
else
```

```
printf ("%d", c);
```

```
}
```

Q. WAP to check whether a no. is divisible by 7 or not.

```
#include <stdio.h>
```

```
int main()
```

```
{ int x;
```

```
scanf ("%d", &x);
```

```
if (x % 7 == 0)
```

```
printf ("No is divisible");
```

```
else
```

```
printf ("not divisible");
```

```
}
```

e. Switch Case -

Syntax - Switch (Expression)
 { ↳ output should be int/char

Case Value 1 : Block 1

break;

Case Value 2 : Block 2

break;

Case Value N : Block N

break;

optional ← default : default block
 }

d. WAP to input a day no. from 1 to 7 and print the corresponding day, using switch case.

#include <stdio>

int main()

{ int d; printf("Enter value from 1 to 7");

scanf("%d", &d);

switch (d>=1 & d<=7)

Case 1: printf("Monday");

break;

Case 2: printf("Tuesday");

break;

Case 3: printf("Wednesday");

break;

Case 4: printf("Thursday");

break;

Case 5: printf("Friday");

break;

Case 6: printf("Saturday");

```

        break;
Case 7: printf ("Sunday");
        break;
default: printf ("invalid");
    }
    
```

note-1. Default block is optional in switch case.

2. If break is remove, all block will run until next break. So, break keyword is mandatory after every case body.

3. If default block is placed in the beginning or b/w any case then break keyword must be used. Default block will check in the last.

4. Switch quantity or expression after solving should provide integer value. Whatever the input

Eg, $d = 1.0000$ ($d > 0$) ($1.000 > 1$)
 true i.e 1

It will print Monday.

~~switch~~

5. In ~~for~~ value, can be an expression of integer or character const.

Eg, Case 1*1 : or Case 2%2 :

6. Case level should be integer or char. Const. Neither variable is allowed

f. All the Case label / value should be unique.

Case 1 : Block A }
 break;
 Case 2 : Block B }
 break;

Error → compile time errors.
 (Duplicate error)

g. int main ()
 {

int x;
 scanf ("%d", &x);
 switch (x)

Case 1: printf ("Hi");
 break;

Case 2: printf ("Hello");
 break;

Case 3: printf ("GLA");
 break;

Case 4: printf ("Hey");
 break;

Case 5: printf ("Section-A");
 break;

default: printf ("Bye");

}

h. For specifying range label, we will use ellipses. ~~e.g.~~ Case 1 ... 5 : Block A;
 break;

If Range 5 ... 1, it will show warning
 and print default value.

Q) WAP to input a no. & check whether no. is even or odd in switch case.

```
#include <stdio.h>
Int main ()
{
    int x;
    Scanf ("%d", &x);
    Switch (x % 2)
    {
        Case 0: printf ("even");
        break;
        Case 1: printf ("Odd");
        break;
    }
}
```

Note: Dead Code: Code which is not in use.

Q.) WAP to input 2 no. & print the largest using switch case.

```
#include <stdio.h>
Int main ()
{
    Int x,y;
    Scanf ("%d %d", &x, &y);
    Switch (x > y)
    {
        Case 1 : printf ("%d", x);
        break;
        Case 0 : printf ("%d", y);
        break;
    }
}
```

⇒ If in above case, $a=b$

then, Case 0: Switch ($b > 0$)
 {

Nested Switch →

Case 1: `printf("%d", b);`
 break;

Case 0: `printf("Both equal %d", a);`
 3.

Q. ~~WAP~~ Input 2 no. and write a MENU driven program for basic arithmetic operations (+, -, *, /, %). Acc to choice of user using switch case.

```
#include <stdio.h>
int main () {
    int a, b, c;
    printf (" MENU\n 1. Addition \n 2. Subtraction \n
    3. Multiplication \n 4. Division \n 5. Modulus ");
}
```

```
printf (" Enter two no. ");
scanf ("%d %d", &a, &b);
printf (" Enter your choice ");
scanf ("%d", &c);
```

Switch (c)

{

Case 1: `printf (" sum = %d", a+b);`
 break;

Case 2: `printf (" Diff. = %d", abs(a-b));`
 break;

Case 3: `printf (" product = %d", a*b);`
 break;

Case 4: printf ("Quotient = %.d", a/b);
 break;
 Case 5: printf ("Remainder = %.d", a%d);
 break;
 default: printf ("invalid choice");

3
3

Note: abs is function which is used for absolute value in math.h syntax, abs(exp.)

Q. WAP to input a character if character is uppercase than convert into lowercase and vice-versa. Using only switch case.

```
#include <stdio.h>
int main()
{
    char ch;
    scanf ("%c", &ch);
    if (ch >= 'A' & & ch <= 'Z')
        or
        if (isupper(ch))
            c = tolower(ch);
        else if (islower(ch))
            c = toupper(ch);
    printf ("%c", ch);
}
```

(using if else)

or.

in ctype header file.

```
else if (ch >= 'a' & & ch <= 'z')
    or
    if (islower(ch))
        c = toupper(ch);
    else if (isupper(ch))
        c = tolower(ch);
    printf ("%c", ch);
```

3-

{ char ch;
 Scanf ("%c", &ch);
 Switch (ch)

}

Case 'A' ... 'Z' : ch = ch + 32;
 or
 'a' ... 'z' : break;

Case '0' ... '9' : ch = ch - 32;
 or
 '0' ... '9'

3 printf ("%c", ch);

Loop Control Statement

White (Entry Controlled / pre test loop)
 for
 do while (Exit Controlled / post test loop)

1# While loop -

Syntax : Initialization of loop Variable;
 while (condition).

{

Body

}

update of loop variable (Inc. / dec.)

note

- Condition is mandatory. if not given then compile time errors.

IF While (condition);

{

}

Block A -

In this case, Block A will not run, cursor will blink.

Q. WAP to display your name 5-times.

```
#include <stdio.h>
int main()
{
    int i=5;
    while (i>=1)
    {
        printf("Kashish\n");
        i=i-1;
    }
}
```

Q. WAP to input & print first n natural no

```
#include <stdio.h>
int main()
{
    int i=1, n;
    scanf("%d", &n);
    while (i<=n)
    {
        printf("./d\n", i);
        i=i+1;
    }
}
```

Q. WAP to print first n natural no in reverse order.

```
#include <stdio.h>
int main()
{
    int n;
    scanf("%d", &n);
```

while ($n <= 1$)

{

printf ("%d\n", n);
 $n = n + 1;$

}

3

Q. int N;

scanf ("%d", &N);

while (N++ > 0);

{

printf ("%d\n", N);
 $N = N + 1;$

}

3

-32767.

Q. WAP to print all even no. from 1 to N.

#include <stdio.h>

int main ()

{ int i=2, n;

scanf ("%d", &n);

while (i <= n)

{

printf ("%d\n", i);
 $i = i + 2;$

}

3

{ int i=1, n;

scanf ("%d", &n);

while (i <= n)

{

if (i % 2 == 0)
printf ("%d\n", i);
 $i = i + 1;$

3.

note → for i=1, it will print 1st n odd no.

Q. WAP to print 1st n even no.

```
#include <stdio.h>
int main ()
{ int i=2, N;
scanf ("%d", &N);
while (i<=2*N)
{
    printf ("%d\n", i);
    i=i+2;
}
```

3.

Q. WAP to print even no. from n to 1.

```
#include <stdio.h>
int main ()
{ int n;
scanf ("%d", &n);
if (N%2 == 1)
    N=N-1;
while (N>0)
{
    printf ("%d\n", N);
}
```

3

Q. WAP to print the sum of first n natural no.

#include <stdio.h>

int main()

{ int N, i=1, s=0;
 scanf ("%d", &N);

while (~~i > N~~) (i <= N) while (i <= N)

{

s = n(n+1)/2;

printf ("%d", s);

3 3

s = s + i;
 i = i + 1;

3 printf ("%d", s);

Q. WAP to find the factorial of a no.

#include <stdio.h>

int main()

{ int N, i=1;

scanf ("%d", &N);

while (i <= N)

{

s = s * i;

i = i + 1;

3

printf ("%d", s);

3.

Q. WAP to input a no. and count no. of digits in that no.

```
#include <stdio.h>
int main()
{
    int n, d=0;
    Scanf ("%d", &n);
    while (n>0)
    {
        d++;
        N=N/10;
    }
    printf ("%d\n", d);
```

3.

note → while ($N \neq 0$) for -ve no.

→ IF ($N == 0$)

printf ("1"); for zero.

else

{

}

Q.1 WAP to input a no. and print all factor of no.

Q.2 WAP to input no. & print it in reverse ~~order~~ order

Q.3 WAP to input no. & check if palindrome or no.

Q.4 WAP to input no & check if perfect or not.

Q.5 WAP to input a no. & check it is prime or not.

Sol-4 #include <stdio.h>
int main()
{ int i=1, s=0, n;
scanf ("%d", &n);
while (i < n)
{ if (n % i == 0)
 s = s + i;
 i = i + 1;
}
if (s == n)
 printf ("Perfect No");
else
 printf ("Not Perfect No");
}

Sol-2 #include <stdio.h>
int main()
{ int n, i;
scanf ("%d", &n);
while (n > 0)
{
 i = n % 10;
 printf ("%d", i);
 n = n / 10;
}
}

Sol-1 #include <stdio.h> int main ()
 { int i=1, n;
 Scanf ("%d", &n);
 while (n >= i)
 {
 if (n % i == 0)
 printf ("%d", i);
 i = i + 1;
 }.

Sol-3 #include <stdio.h>

{ int main ()
 { int M, N, R, Rev = 0;
 Scanf ("%d", &N);
 M = N;

while (N > 0)
{

$$R = N \% 10;$$

$$Rev = Rev * 10 + R;$$

$$N = N / 10;$$

}

~~if (M == Rev)~~

printf ("Palindrome");
 else

printf ("Not Palindrome");

}

Sof. 5

#include <stdio.h>

int main ()

{ int n, i, c=0;
 scanf ("%d", &n);

while (i<=n)

{ if (n/i==0)

c=c+1;

i=i+1;

}

if (c==2)

printf ("prime");

} else printf ("Not prime");

#

FOR Loop -

Syntax - for (Exp 1/initialization of loop variable ;
 Exp 2/condition ; Exp 3/updation)

{

Body

}

Note

→ Exp 1 will run first and only one time.

→ Then Exp 2 condition true , then body then Exp 3.
 → If Exp 2 wrong loop will end.

2 → All the 3 exp. in for loop are optional.

3 → Braces are mandatory for more than 1 line
 in body.

Eg → ① To print natural no.

#include <stdio.h>

int main()

{ int i, n;

scanf("%d", &n);

for (i=1; i<=N; i=i+1)

printf("%d", i);

}

{ int i=1, n;

scanf("%d", &n);

for (; i<=N; i=i+1)

printf("%d", i);

}

②

for (i=1; i<=N; i++);

printf("%d", i);

i = i + 1;

2) n + 1

i = 1, n = 5

③ for (; ;)

{ printf("%d", i);

i++;

if (i > N)

break;

1, 2, 3, 4, 5

}

Q.1 WAP to input a no. and print table of no. in tabular form.

Q.2 WAP to input a,b no. and find $(a \times b)$ without (*) operator.

Q.3 WAP to input a & b and find A^B without pow.

Q.4 WAP to input a no. and find binary of no.

Sol.1 #include <stdio.h> (using for)

```
int main()
{
    int n, i;
    scanf("%d", &n);
    for (i = 1; i <= 10; i++)
    {
        printf ("%d * %d = %d\n", n, i, n * i);
    }
}
```

#include <stdio.h> (using while).

```
int main()
{
    int n, i = 1;
    scanf ("%d", &n);
    while (i <= 10)
    {
        printf ("%d * %d = %d\n", n, i, n * i);
        i = i + 1;
    }
}
```

Sol.2 #include <stdio.h> (using for).

```
int main()
{ int i, p=0, a,b;
    scanf ("%d,%d",&a,&b);
    for (i=1, i<=b; i++)
        p = p + a;
    printf ("%d", p);
```

#include <stdio.h> (using while).

```
int main()
{ int i=1, p=0, a, b;
    scanf ("%d,%d",&a,&b);
    while (i<=b)
    { i = i + 1;
        p = p + a;
        printf ("%d", a);
    }
```

Sol.3 #include <stdio.h> (using while).

```
int main()
{ int a,b, i=1, p=1;
    scanf ("%d,%d",&a,&b);
    while (i<=b)
    { i = i + 1;
        p = p * a;
    }
    printf ("%d", p);
```



```
#include <stdio.h>
```

```
int main()
```

```
{ int a,b,i,p=1;
```

```
scanf("%d%d", &a, &b);
```

```
for (i=1; a<=b; i=i+1)
```

```
    p=p*a;
```

```
printf("%d", p);
```

```
}
```

2. # do while loop:

Syntax - Initialization

do

{

Body

3 update of loop variable

while (condition);

1. One body will run then condition will check if true then body and so no. Condition is mandatory.

2. (;) after while Condition is mandatory.

3. for Performing task atleast one.

4. Print n natural no.

```
5 int i=1, n;
    scanf("%d", &n);
    do
```

```
        printf("%d", i);
        i++
```

```
    while (i <= n);
```

Q. WA menu driven program for basic arithmetic operation (+, -, *, /, %) using switch case acc to choice of user for 2 integer no. Use this functionality again and again as per the choice of the user, using do while loop

```
#include <stdio.h>
```

```
int main()
```

```
{ int a, b, c;
```

```
do {
```

char ch; // Menu in 1. Add In 2. Sub In 3. Mult. In 4. Div In 5. Mod

printf (" Enter two no. & choice from menu ");

scanf ("%d %d %c", &a, &b, &c);

switch (c)

{

Case 1 : printf (" sum = %d ", a+b);
 break;

Case 2 : printf (" Diff = %d ", a-b);
 break;

Case 3 : printf (" Mult = %d ", a*b);
 break;

Case 4 : printf (" Quot = %d ", a/b);
 break;

Case 5 : printf (" Remainder = %d ", a%b);
 break;

~~Case 6 :~~

default : printf (" Invalid choice ");

}

printf (" Do you want to continue Press Y or N ");

scanf ("%c", &x);

3 while ~~for~~ x = 'y' || x = 'Y';

3