

Dry Run -

- Tracing code manually is dry run.
- Dry run practice to overcome mistakes in tracing code.

Common mistakes -

- Skipping line or incomplete tracing.
- Do not pen down variable value updates.
- Not tracing the code but tracing what is in your mind.
- Reading mistake.
- Conceptual mistake.

Two established urban centers with high density of
residential residential

metres ~

Non-residential buildings have high density of

8 10 12
10 12 14

• Skipping line on incomplete tracing -

→ Print first 10 natural numbers in reverse order.

main()

{

int i=10;

while (i<=10)

{

printf "%d", i;

i--;

}

}

j j j j j j j j j j →
 [10] → [9] → [8] → [7] → [6] → [5] → [4] → [3] → [2] → [1], [0] [-1]

10 9 8 7 6 5 4 3 2 1 0 -1 -

((i<=10)&&(i>0))

• Do not pen down variable value update and operator precedence -

→ main()

{

int n=5,y;

③ ⑥
y = n++;

- order

printf "%d %d", n, y;

)

~~n~~ n y
 [] [6] [5]

- Not tracing the code but what in your mind-
- Swap of two numbers -

main()

{

int x=5, y=6;

x=y; ↪

y=x;

}

printf("x=%d y=%d", x, y);

x [6] y [6]

(bottom left frame)

(middle)

- Reading mistake

→ main()

{

int n=5

if(n=4)

 printf("Hi");

else

 printf("Bye");

}

= assignment

== equal to when address stored in A

~~if()~~

define ans as if Non-zero value if true else 0

int ans = if (condition) statement1 : statement2

int ans = (condition) ? statement1 : statement2

int ans = condition ? statement1 : statement2

Kreator

10251

```

→ main()
{
    int n;
    printf("Enter a number");
    scanf("%d", &n);
    y = n * n;
    printf("Square of %d is %d", &n, &y);
}

```

- Conceptual mistake -

```

main()
{
    int n=5;           n [5]
    if (n == 4)
        {
            printf("Hi");
            printf("Sun");
        }
    else
        printf("Bye");
}

```

Conclusion -

- Always write variable value updated.
- Read since letter by letter.
- Evaluate arithmetic expression according to precedence rule of operators.
- Give time for dry run.

Remember one good dry brain can give you what
no programme can't give you.

Sedate mind sits at will
of it.

(This may take 1 hour or less but will be effective -
and no need of sleep again -
but sleep the next night, it's more efficient -
also basketball will respond to that thing
which is not available elsewhere)

E: academic work related things

5 am and

Warm up Programs -

1. Program to add two numbers -

How to think steps?

• Tips -

- Imagine and design output (what you want)
- Design steps to perform
- Write some code, dry run it again and again till it becomes the desired code.

→ `#include <stdio.h>`

`int main()`

```
{  
    int a, b, c;  
    printf("Enter two numbers:");  
    scanf("%d %d", &a, &b);  
    c = a + b;  
    printf("Sum is %d", c);  
    getch();  
}
```

Output - Enter two numbers: 3
4

Sum is 7

2- Area of Circle -

```
→ #include <stdio.h>
int main()
{
    int r;
    float a;
    printf("Enter the radius of a circle:");
    scanf("%d", &r);
    a = 3.14 * r * r;
    printf("Area is %f", a);
    getch();
}
```

Output- Enter radius of a circle: 5
Area is 78.500000

3- WAP which takes input as integer only that is restrict other characters from input.

```
→ #include <stdio.h>
#include <conio.h>
int getIntegerOnly()
int main()
{
    int n=0;
    n = getIntegerOnly();
    printf("You have Entered %d", n);
}

int getIntegerOnly()
{
    int num=0, ch;
    do
    {
        ch = getch();
        if (ch >= 48 && ch <= 57)
    }
```

```

        printf("%c", ch);
        num = num * 10 + (ch - 48);
    }
    if(ch == 13)
        break;
} while(1);
return(num);
}

```

Output - 124

You have Entered: 123

Elementary tricky programs-

1- How to print %d using printf

```

→ #include <stdio.h>
main()
{
    printf("%d");
}

```

Output - %d

2- WAP to swap two numbers.

```

→ #include <stdio.h>
main()
{
    int a, b, c;
    printf("Enter two numbers:");
    scanf("%d %d", &a, &b);
    c = a;
    a = b;
    b = c;
    printf("a=%d b=%d", a, b);
}

```

Output - Enter two numbers: 2 5
a=5 b=2

3- WAP

```

variables
→ #include
main()
{
    in
    p
    c
}

```

Output

4- Check

```

→ #include
main()
{
    in
    p
    c
}

```

Output

2- WAP to swap two numbers without using third variable.

→ `#include <stdio.h>`

```
main()
{
```

```
    int a, b;
```

```
    printf("Enter two numbers:");
```

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

```
    a = a + b;
```

```
    b = a - b;
```

```
    a = a - b;
```

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

```
}
```

Output- Enter two numbers: 5

6

a=6 b=5

4- Check whether a number is even or odd.

→ `#include <stdio.h>`

```
main()
{
```

```
    int n;
```

```
    printf("Enter the number:");
```

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

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

```
        printf("Even number");
```

```
    else
```

```
        printf("Odd number");
```

```
}
```

Output- (i) Enter the number: 5

Odd number

(ii) Enter the number: 12

Even number

5- Check whether a number is even or odd without using Module operator.

→ #include <stdio.h>

main()
{

```
int n;
printf("Enter the number: ");
scanf("%d", &n);
if (n % 2 == 0)
    printf("Odd number");
else
    printf("Even number");
```

Output - i) Enter the number: 5

Odd number

ii) Enter the number: 12

Even number

Logic - for a odd number in binary number at
bit at ~~odd~~ even number in binary is
bit of 0 at ~~odd~~ & at ~~even~~ 16 bits in binary
at compare ~~odd~~

6- WAP to check whether a number is even or odd without using module and bitwise operator.

→ #include <stdio.h>

main()
{

```
int n;
printf("Enter the number: ");
scanf("%d", &n);
if (n / 2 * 2 == n)
```

DATE _____
PAGE No. 11

DATE _____
PAGE No. 11

else

 printf("Odd number");

}

Output (i) Enter the number: 5

Even number

(ii) Enter the number: 19

Odd number

Logic-

जबकि फार्सी नंबर को 2 से भाग जाएँ तो 2 से विभाग होता है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए integer की जरूरत नहीं होती। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है। यदि विभाग के परिणाम में अंश ऐसा हो कि इसके लिए float की जरूरत होती है।

7- WAP to move your name without keystrokes

→ #include < stdio.h >

#include < conio.h >

#include < windows.h >

Void galaxy(int x, int y)

{

COORD c;

c.X=x;

c.Y=y;

SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE),

c;

main()

{

int x=54,y=14;

galaxy(x,y);

```

DATE _____
PAGE No. 12

printfl("Satyam-Seth");
while(1)
{
    ch = getch();
    switch(ch)
    {
        case 'd':
            n--;
            break;
        case 's':
            n++;
            break;
        case 'w':
            y--;
            break;
        case 'z':
            y++;
            break;
        case 27: // ASCII Value of Esc key
            exit(0);
    }
    system("cls");
    gotoxy(n,y);
    printfl("Satyam-Seth");
}

```

Note मार्ग दर्शक Old IDE को use करेंगे।
 (Turbo C++)
 <Window.h> की include करने की ज़रूरत है।
 को define करने की आवश्यकता नहीं है।
 system("cls") वर्षी IDE के लिए use करते हैं।
 काम पुराने IDE में clear(), करता है।
 use screen की साथ करने के लिए करते हैं।

Program
 1- WAP
 on odd
 #include
 main()
{
 int
 p;
 l;
 if
 j;
 }
Output-

2- WAP
 by
 #include
 main()
{
 j
 i;
 l;
 }
} Kreator

Programs on decision control (if, else, switch)

1- WAP to check whether a given number is even or odd.

```
#include <stdio.h>
main()
{
    int n;
    printf("Enter the number:");
    scanf("%d", &n);
    if(n%2)
        printf("%d is odd number", n);
    else
        printf("%d is even number", n);
}
```

Output-(i) Enter the number: 15

15 is odd number

(ii) Enter the number: 22

22 is even number

2- WAP to check whether a given number is divisible by 5 or not.

```
#include <stdio.h>
main()
{
    int n;
    printf("Enter a number:");
    scanf("%d", &n);
    if(n%5 == 0)
        printf("%d is divisible by 5", n);
    else
        printf("%d is not divisible by 5", n);
}
```

Output - Enter the value of A: 5

Enter the value of B: 3

5 is greatest number

3 - WAP to find greatest number ~~between two~~ between two numbers.

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

```
main()
```

```
{
```

```
    int a, b;
```

```
    printf("Enter the value of A:");
```

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

```
    printf("Enter the value of B:");
```

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

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

```
        printf("%d is greatest number", a);
```

```
    else if(b > a)
```

```
        printf("%d is greatest number", b);
```

```
    else
```

```
        printf("%d and %d are equal", a, b);
```

```
}
```

Output - Enter the value of A: 20

Enter the value of B: 20

20 is greatest number.

4- WAP to find greater among three numbers.

(i) #include <stdio.h>

{ main()

int a,b,c;

printf("Enter 3 numbers:");

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

if(a>b && a>c)

k=a;

if(b>a && b>c)

k=b;

if(c>a & c>b)

k=c;

printf("Greater number is %d", k);

}

(ii) #include <stdio.h>

main()

{

int a,b,c,k;

printf("Enter the value of A:");

scanf("%d", &a);

printf("Enter the value of B:");

scanf("%d", &b);

printf("Enter the value of C:");

scanf("%d", &c);

if(a>b & a>c)

k=a;

else

{ if(b>c)

k=b;

```

    else
        k = c;
    }
    printf("Greatest number is %d", k);
}

```

```

(iii) #include <stdio.h>
main()
{
    int a, b, c, k;
    printf("Enter 3 Numbers:");
    scanf("%d %d %d", &a, &b, &c);
    if (a > b)
    {
        if (a > c)
            k = a;
        else
            k = c;
    }
    else
    {
        if (b > c)
            k = b;
        else
            k = c;
    }
    printf("Greatest number is %d", k);
}

```

Note - यह Program में कोई Condition नहीं है। यहाँ से आपको इसका लिए एक अच्छा उदाहरण होगा।

(iv)

```

#include
main()
{
    i
    j
    s
    t
}

```

5 - WAP

```

#include
#include
main()
{

```

DATE _____
PAGE NO. 16

```
(iv) #include <stdio.h>
main()
{
    int a, b, c, d;
    printf("Enter 3 numbers:");
    scanf("%d %d %d", &a, &b, &c);
    printf("Greater number is %d", a>b? a>c? a: b>c? b: c);
}
```

5 - WAP to find the roots of quadratic equation.

```
#include <stdio.h>
#include <math.h>
main()
{
    int a, b, c, D;
    float x, y;
    printf("Enter the coefficient of x^2 (Value of a):");
    scanf("%d", &a);
    printf("Enter the coefficient of x (Value of b):");
    scanf("%d", &b);
    printf("Enter the constant (Value of c):");
    scanf("%d", &c);
    D = b*b - 4*a*c;
    if (D == 0)
    {
        printf("Both roots are equal");
        x = -b / (2.0 * a);
        printf("Root is %.2f", x);
    }
    if (D < 0)
        printf("Both roots are imaginary");
    if (D > 0)
```

↳
 printf("Roots are equal and distinct");
 $x = (-b + \sqrt{D}) / (2 * a);$
 $y = (-b - \sqrt{D}) / (2 * a);$
 printf("Roots are %0.4f, %0.4f", x, y);
 } }

5. WAP to check leap year or not.

```
(i) #include < stdio.h >
main()
{
    int year;
    printf("Enter a year ");
    scanf("%d", &year);
    if (year % 4)
        printf("Not a leap year");
    else if (year % 100)
        printf("Leap year");
    else if (year % 400)
        printf("Not a leap year");
    else
        printf("Leap year");
}
```

(iii) - #include <stdio.h>
main()
{
 int year;
 printf("Enter a year: ");
 scanf("%d", &year);
 if (year % 100 == 0)
 {
 if (year % 400 == 0)
 printf("Leap year");
 else
 printf("Not a leap year");
 }
 else
 {
 if (year % 4 == 0)
 printf("Leap year");
 else
 printf("Not a leap year");
 }
}

Programme on Loops (while, do while, for) -

- 1- WAP to print your name 5 times on the screen.

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

```
main()
```

```
{
```

```
int i=1;
```

```
while (i <= 5)
```

```
{
```

```
printf(" System");
```

```
i++;
```

```
}
```

- 2- WAP to print first 10 natural numbers.

(i)

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

```
main()
```

```
{
```

```
int i=1;
```

```
while (i <= 10)
```

```
{
```

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

```
i++;
```

```
}
```

(ii)

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

```
main()
```

```
{
```

```
int i;
```

```
for (i=1; i <= 10; i++)
```

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

Kreator

(iii)

3-

(i)

```
#inc
```

```
ma
```

```
{
```

(ii)

```
#inc
```

```
ma
```

```
{
```

(iii)

```
#inc
```

```
ma
```

```
{
```

(i) `#include <stdio.h>`
`main()`

```
{  
    int i=1;  
    do  
    {  
        printf("%d", i);  
        i++;  
    } while(i<=10);  
}
```

Q. WAP to print first 10 natural numbers in reverse order.

iii `#include <stdio.h>`

```
main()  
{  
    int i=10;  
    while(i<=10)  
    {  
        printf("%d", 11-i);  
        i++;  
    }  
}
```

(ii) `#include <stdio.h>`

```
main()  
{  
    int i=10;  
    for(i=10;i>=1;i--) // for(i=10;i>=1;i--).  
    {  
        printf("%d", 11-i); // printf("%d", i);  
    }  
}
```

(iii)

```
#include <stdio.h>
main()
```

```
{  
    main int i=1;  
    do  
    {  
        printf("%d ", 11-i);  
        i++;  
    } while(i <= 10);  
}
```

6-

4- WAP to print first N natural numbers.

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

```
main()
```

```
{  
    int i, N;  
    printf("Enter the value of N: ");  
    scanf("%d", &N);  
    for(i=1; i<=N; i++)  
        printf("%d", i);  
}
```

7-

5- WAP to print first N natural numbers in reverse order.

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

```
main()
```

```
{  
    int i, N;  
    printf("Enter the value of N: ");  
    scanf("%d", &N);  
    for(i=N; i>=1; i--) // for(i=1; i<=N; i++)  
        printf("%d", i); // printf("%d", N+1-i);  
}
```

8-

6- WAP to print first 10 even natural numbers.

```
#include <stdio.h>
main()
{
    int i;
    for (i=1; i<=10; i++)
        printf("%d ", 2*i);
```

7- WAP to print first 10 odd natural numbers.

```
#include <stdio.h>
main()
{
    int n;
    for (n=1; n<=10; n++)
        printf("%d ", 2*n-1);
```

8- WAP to print first N even numbers.

```
#include <stdio.h>
main()
{
    int N, i;
    printf("Enter the value of N:");
    scanf("%d", &N);
    for (i=1; i<=N; i++)
        printf("%d ", 2*i);
```

9- WAP to print first N odd natural numbers.

#include <stdio.h>

main()

{

int i, N;

printf("Enter the value of N:"); i tri.
scanf("%d", &N); (i=1 to N) not

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

{ printf("%d ", 2*i-1); } i tri.

}

(odd numbers from 1 to N)

odd numbers from 1 to N

odd numbers from 1 to N

odd numbers from 1 to N

10- WAP to print N even natural numbers in reverse order.

#include <stdio.h>

main()

{

int N;

printf("Enter the value of N:"); i tri.

scanf("%d", &N); (i=1 to N) not

while(N)

{

printf("%d ", 2*N); } i tri.

N--;

}

(even numbers from N to 1)

even numbers from N to 1

even numbers from N to 1

even numbers from N to 1

}

(even numbers from N to 1)

even numbers from N to 1

even numbers from N to 1

even numbers from N to 1

11- W

get

#

ma

{

12- WAP

#incl

main

{

}

{

}

Kreator

100% ✓

11- WAP to print N odd natural numbers in reverse order.

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

```
main()
```

```
{
```

```
int N;
```

```
printf("Enter the value of N:");
```

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

```
while (N)
```

```
<
```

```
printf("Enter the value of %d", 2 * N - 1);
```

```
N--;
```

```
}
```

12- WAP to print table of user's choice.

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

```
main()
```

```
{
```

```
int n; // value will be entered by user
```

```
printf("Enter a Number:");
```

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

```
for (i=1; i<=10; i++)
```

```
printf("%d * %d = %d", n, i, n*i);
```

```
}
```

13- WAP to calculate sum of first N natural numbers.

```
#include <stdio.h>
main()
{
    int N, S = 0;
    printf("Enter a natural number: ");
    scanf("%d", &N);
    for(i=1; i<=N; i++)
        S = S + i;
    printf("Sum = %d", S);
}
```

14- WAP to calculate product of first N natural numbers.

```
#include <stdio.h>
main()
{
    int k=1, N, i;
    printf("Enter the value of N: ");
    scanf("%d", &N);
    for(i=1; i<=N; i++)
        k *= i;
    printf("Product = %d", k);
}
```

15- WAP

```
#include
main()
{
```

16- WAP

```
numbers
#include
main()
{
```

15- WAP to calculate factorial of a number.

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

```
main()
```

```
{
```

```
int n, f = 1, i;
```

```
printf("Enter the number: ");
```

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

```
i = n;
```

```
while(i >= 1)
```

```
{
```

```
f *= i;
```

```
i--;
```

```
}
```

```
printf("Factorial of %d = %d", n, f);
```

```
}
```

16- WAP to calculate sum of first N even natural numbers.

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

```
main()
```

```
{
```

```
int n, i, sum = 0;
```

```
printf("Enter the value of N: ");
```

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

```
while(i <= 2 * n)
```

```
{
```

```
sum += i;
```

```
i += 2;
```

```
}
```

```
printf("Sum of %d even numbers = %d", n, sum);
```

17- WAP to calculate sum of first N odd natural numbers.

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

```
main()
```

```
{  
    int i=n, sum=0;  
    printf("Enter the value of N: ");  
    scanf("%d", &n);  
    while(i<=n)  
    {  
        sum+=2*i-1;  
        i++;  
    }
```

```
    printf("Sum of first %d odd natural numbers %d", n, sum);  
}
```