Assignment 1
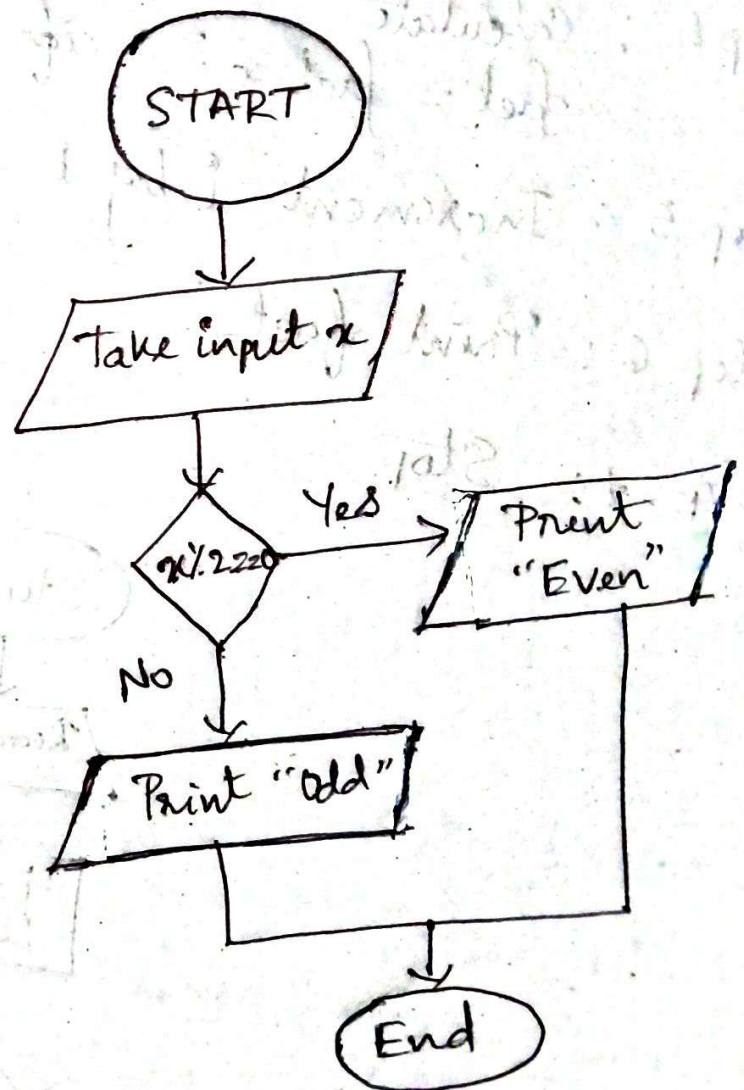
1. Check if the given number is Even or Odd.

Step1. Take input x.
Step2. if x%2 == 0 Print even
Step3: else print odd.
Step 4: End.

```
START
  ↓
Take input x
  ↓
x%2==0 ──Yes──> Print "Even"
  │                  │
  No                 │
  ↓                  │
Print "Odd"          │
  │                  │
  └────────┬─────────┘
           ↓
          End
```

2. Factorial of a given number.
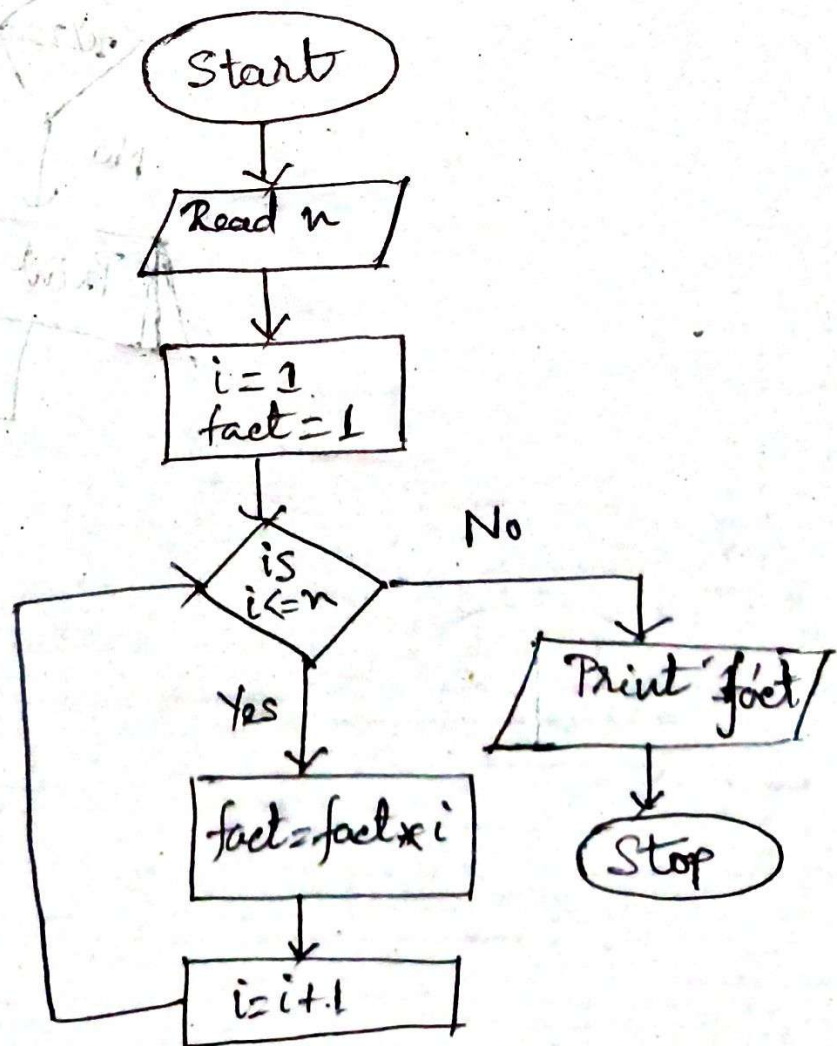
Step 1: Start.

Step 2: Read a number n.

Step 3: Initialize variables.
  $i = 1$ $fact = 1$

Step 4: Calculate
  $fact = fact * i$ if $n > 1$ else print "fact".

Step 5: Increment i by 1 $i = i+1$ and go to step 4.

Step 6: Print fact.

Step 7: Stop.

```
        ( Start )
            |
            v
      / Read n /
            |
            v
      | i = 1    |
      | fact = 1 |
            |
            v
          / is \        No
          \ i<=n /  ------------>  / Print "fact" /
            |                            |
           Yes                           v
            v                         ( Stop )
      | fact=fact*i |
            |
            v
      | i = i+1 |
```

3. Factorial of a number using Recursion.

Step 1 : Start

Step 2 : Read number n.

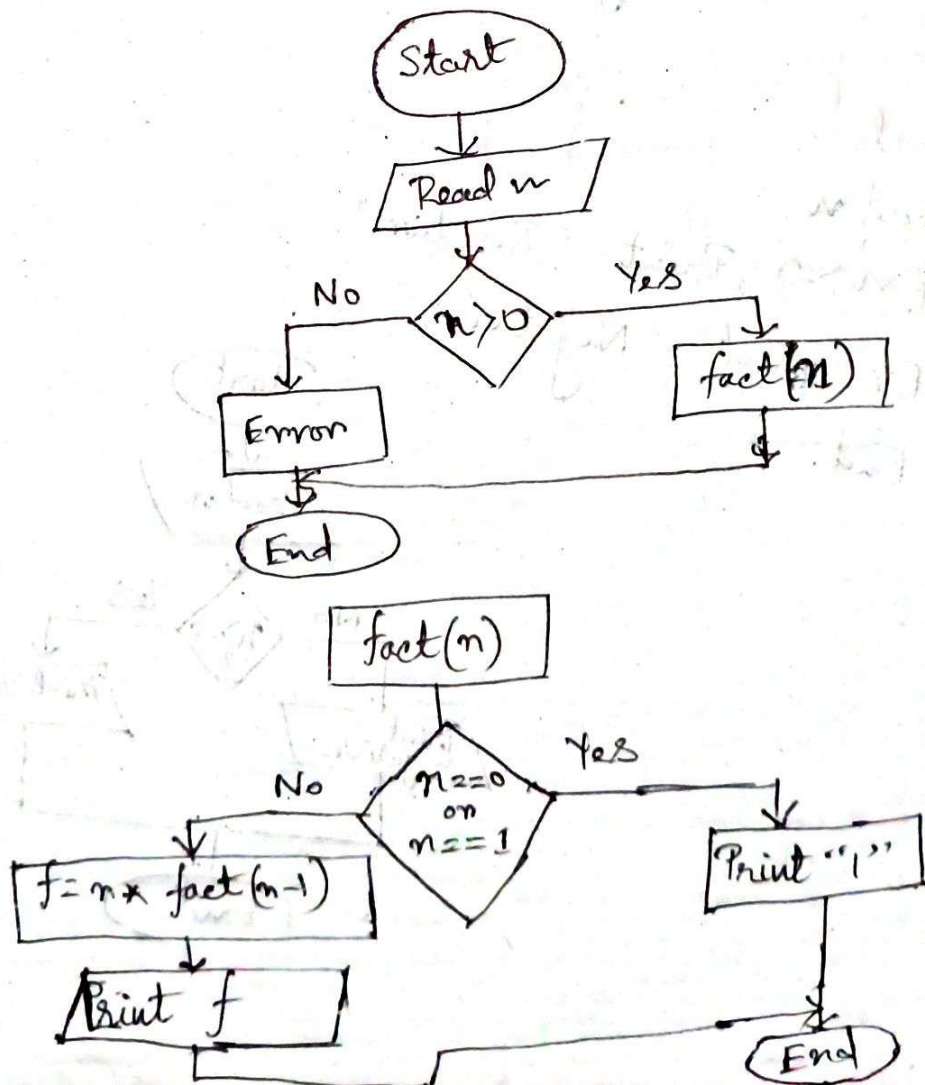Step 3 : Call factorial (n)

Step 4 : Print factorial f.

Step 5 : Stop.

factorial (n)

Step 1 : if n==1 or 0 Return 1

Step 2 : Else
$$f = n * factorial (n-1)$$

Step 3 : Return f

4. Swap two numbers without using third variable.
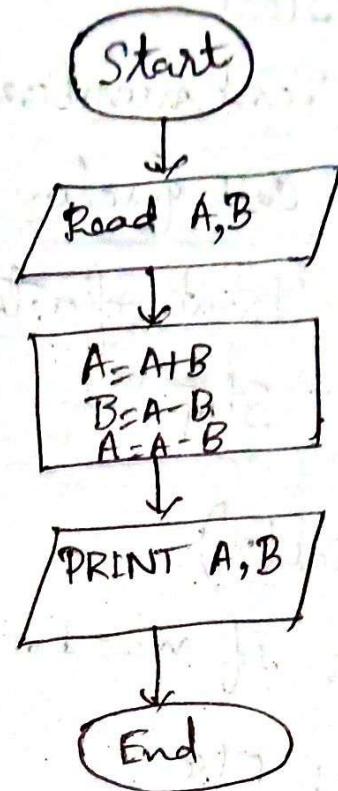
Step 1: Start.

Step 2: Read A, B

Step 3: A = A+B

Step 4: B = A-B

Step 5: A = A-B

Step 6: Print A, B

Step 7: End

```
Start
  |
  v
Read A, B
  |
  v
A = A+B
B = A-B
A = A-B
  |
  v
PRINT A, B
  |
  v
End
```
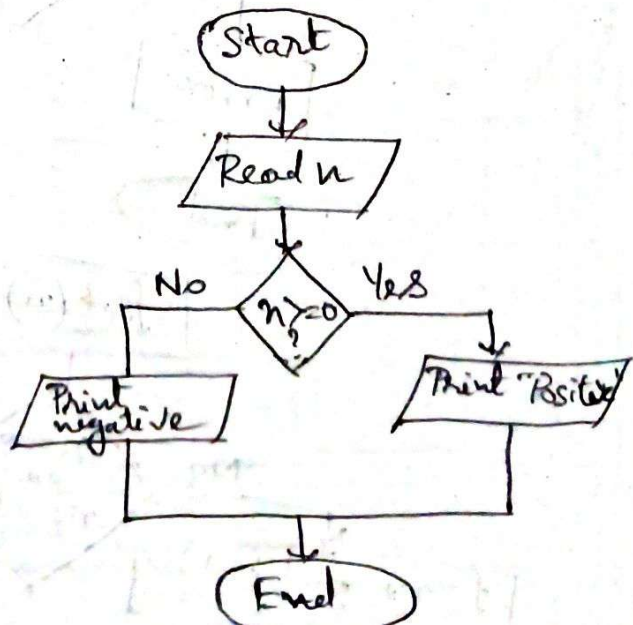
5. Check whether the given no. is positive or Not.

Step 1: Start.

Step 2: Read n.

Step 3: if n >= 0, Print 'Positive'

Step 4: Else print 'Negative'.

Step 5: End.

```
Start
  |
  v
Read n
  |
  v
n >= 0 ?
 No /    \ Yes
   v        v
Print      Print 'Positive'
negative
   \        /
      v
     End
```

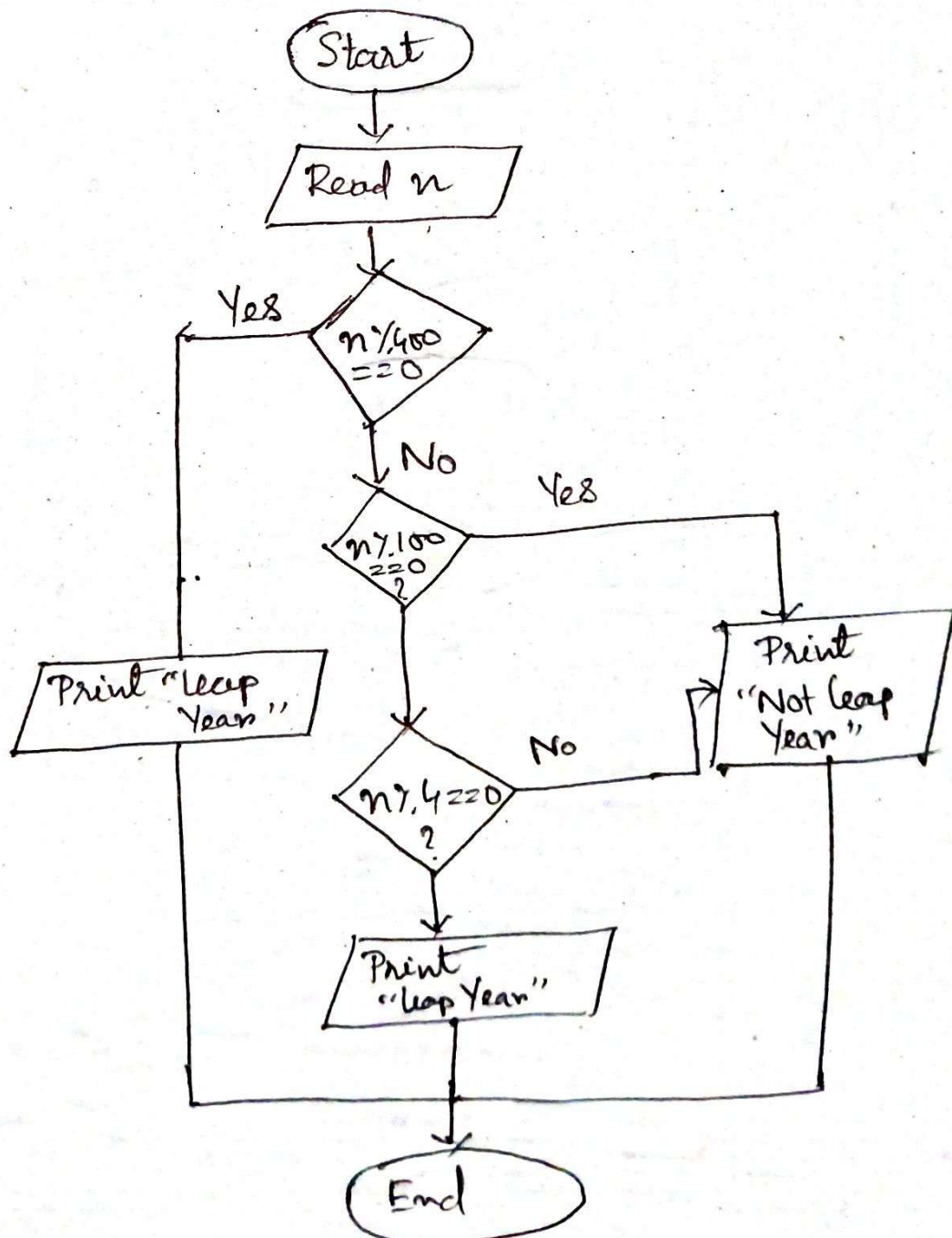6. Given no. is leap year or not.

Step 1 : Start.

Step 2 : Read the input year n.

Step 3 : If $(n \% 400 == 0)$ OR $(n \% 4 == 0$ AND $n \% 100 \; != 0)$

PRINT "Leap Year"

Step 4 : Else PRINT "NOT Leap Year"
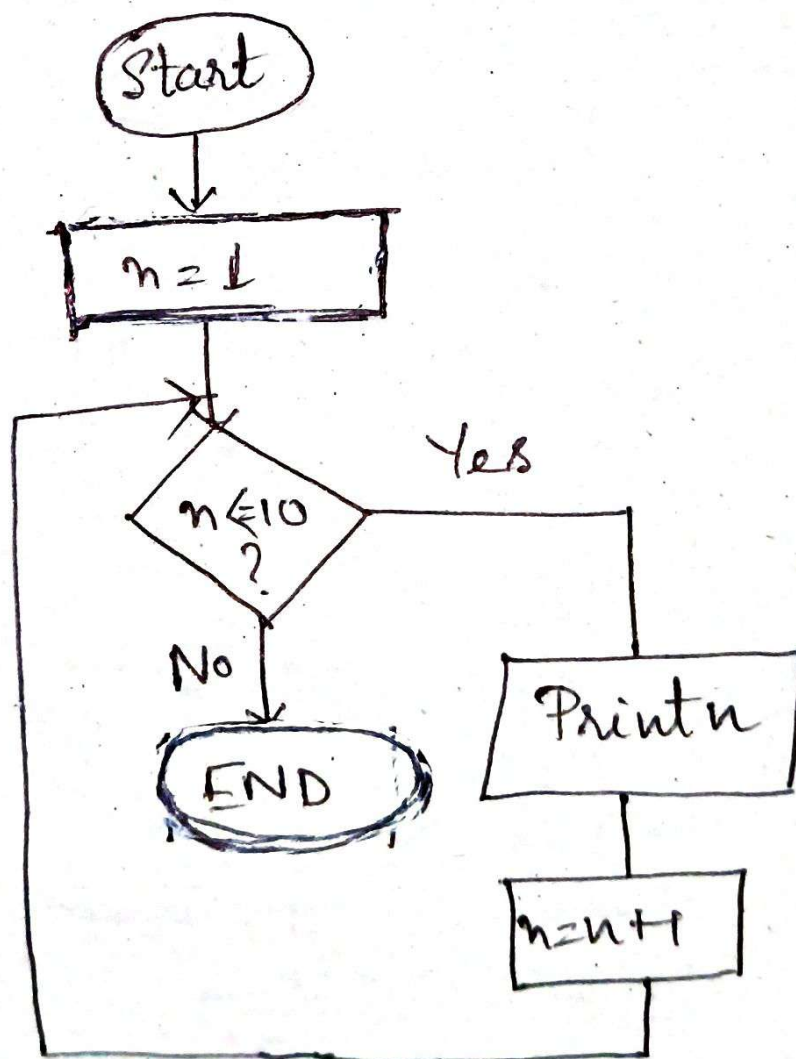
Step 5 : End.

7. Print 1 to 10 without using loop.

Step 1 : Start.

Step 2 : n = 1

Step 3 : if n <= 10, Print n

Step 4: n = n+1, Go to step 3.

Step 5: End

8. Print digits of a given no.

Step1 : Start.

Step2 : Read n.

Step 3 : If n!=0 Goto Step 4
Else goto step 8

Step 4 : digit = n % 10

Step 5: n = n/10.

Step 6: Print digit.

Step 7: Repeat step 3.

Step 8 : End.
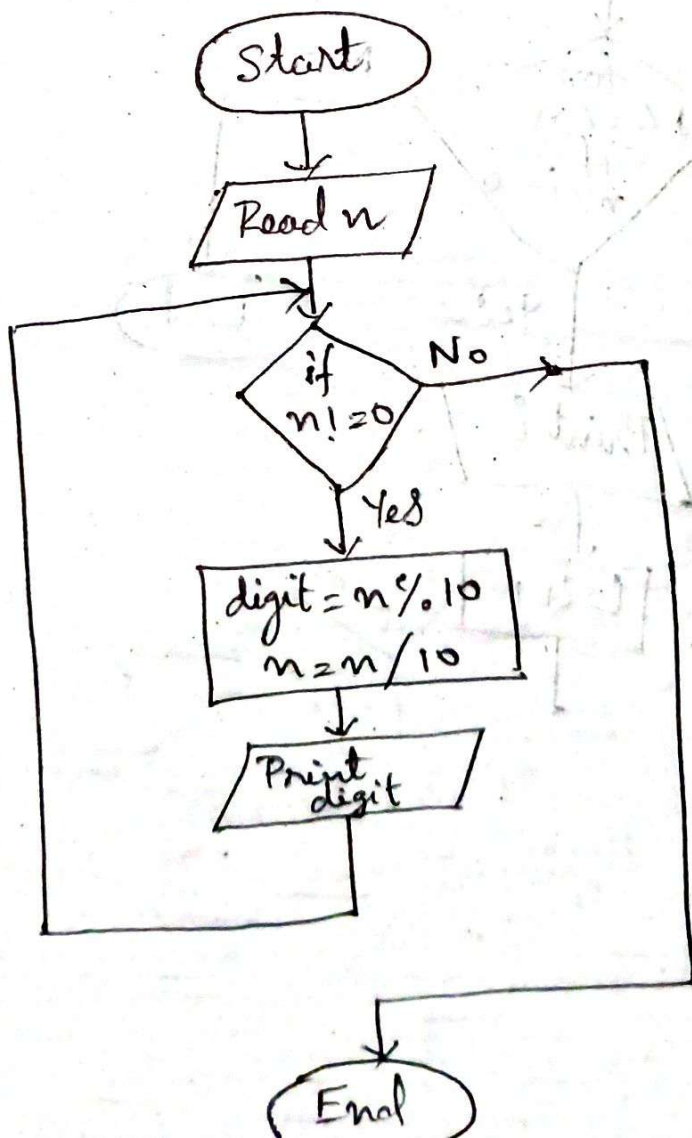
9. Print all the factors of a given no.

Step1 : Start.

Step2 : Read input n.

Step3 : for i 1 to n; if $n \% i == 0$

   Print i

Step4 : i = i+1

Step5 : End.

```
           ( Start )
              |
              v
         / Read n /
              |
              v
           / for
          < 1<i<n            No
           \  if      \
            \ n%i==0  /------\
              |                \
             Yes                v
              |               ( End )
              v
         / Print i /
              |
              v
          [ i=i+1 ]
```
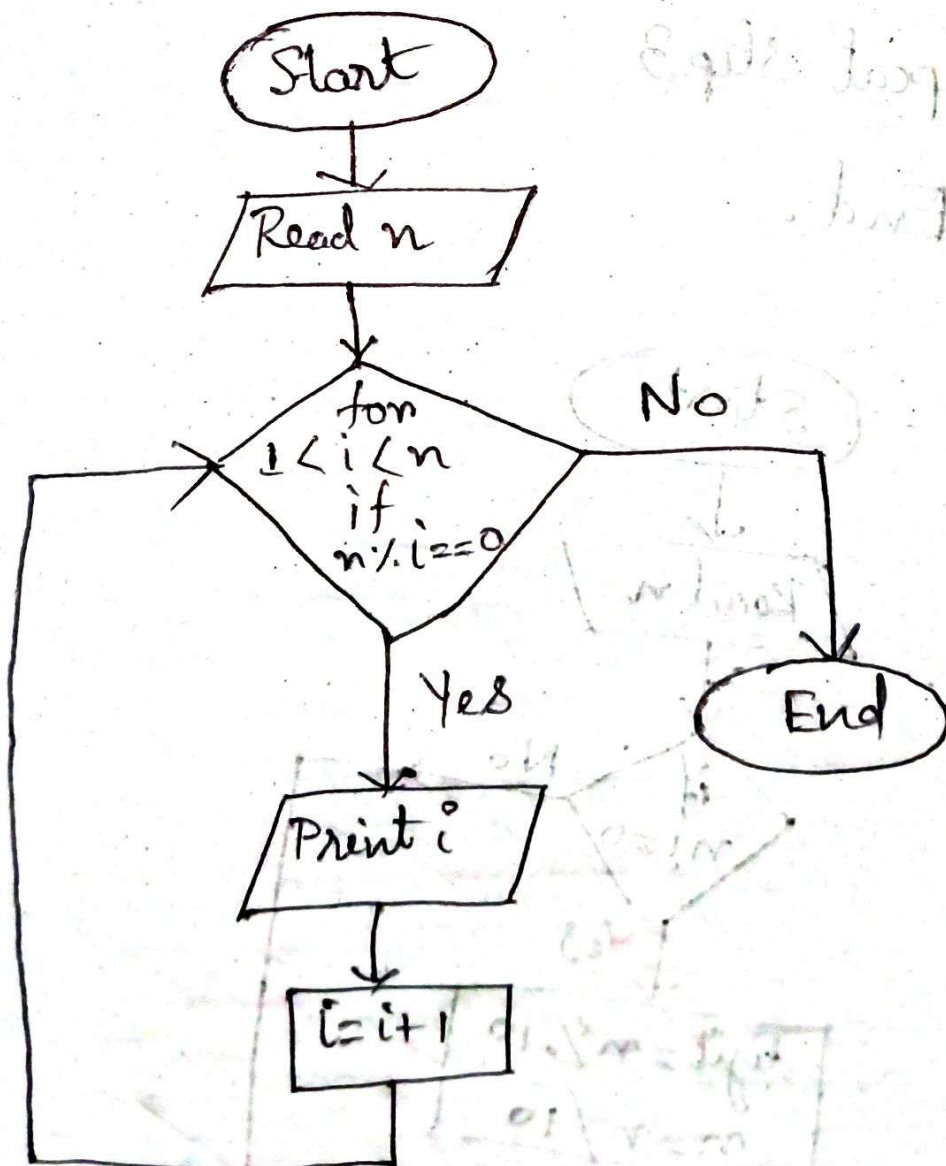
10. Sum of all digits of a given number.

Step 1 : Start

Step 2 : Read input n.

Step 3 : Sum = 0

Step 4 : if $(n == 0)$ Return 0

Step 5 : Else

$digit = n \% 10$

Sum = Sum + digit.

$n = n / 10$,

Step 6 : Print Sum

Step 7 : End.

```
                    Start
                      |
                      v
                  Read n
                      |
                      v
                  Sum = 0
                      |
                      v
                  /   n==0   \      Yes
                  \    ?     /  ---------->  Print
                      |                        0
                      No
                      |
                      v
              digit = n % 10
              Sum = Sum + digit
              n = n / 10
                      |
                      v
                 Print Sum
                      |
                      v
                   End
```
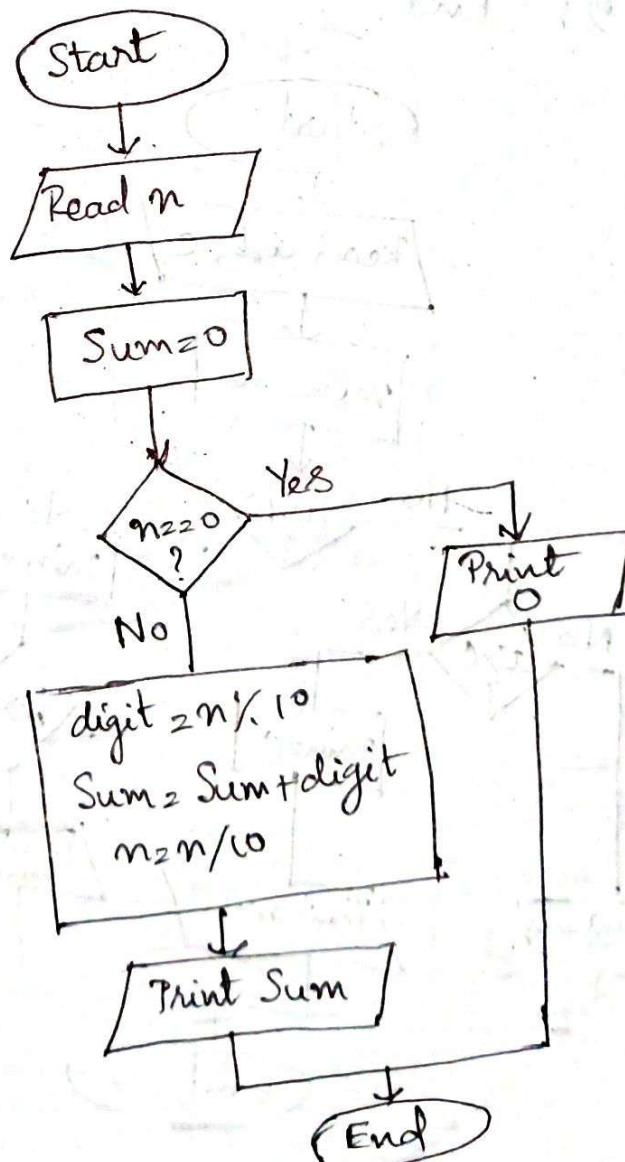
11. Find smallest of 3 nos (a,b,c)
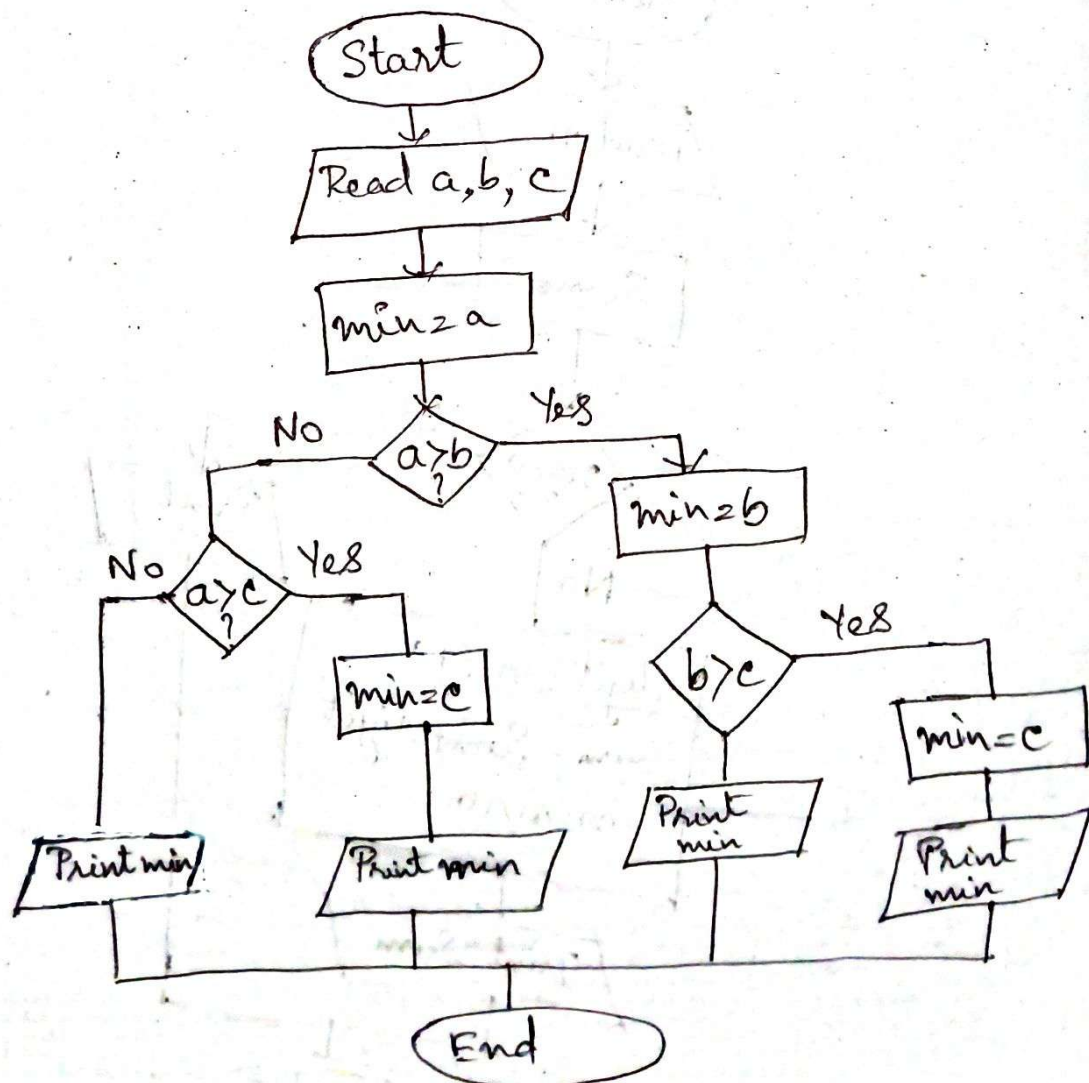
Step 1 : Start.

Step 2 : Read a,b,c.

Step 3 : min = a.

Step 4 : is a>b ?

Step 5 : if true, min=b

Step 6 : is b>c ?

Step 7 : if true, min = c.

Step 8 : Print min

Step 9 : End.

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                    ┌─────────────┐
                    │ Read a,b, c │
                    └─────────────┘
                         │
                    ┌─────────┐
                    │ min = a │
                    └─────────┘
                         │
              No      ╱a>b╲      Yes
           ┌─────────◇  ? ◇──────────┐
           │         ╲   ╱           │
           │          ╲ ╱       ┌─────────┐
      No  ╱a>c╲  Yes            │ min = b │
     ┌───◇  ? ◇───┐            └─────────┘
     │    ╲  ╱    │                 │
     │     ╲╱  ┌───────┐      ╱b>c╲   Yes
     │         │min = c│     ◇     ◇────────┐
     │         └───────┘      ╲   ╱         │
┌─────────┐       │        ┌───────┐   ┌─────────┐
│Print min│  ┌─────────┐   │ Print │   │ min = c │
└─────────┘  │Print min│   │  min  │   └─────────┘
             └─────────┘   └───────┘        │
                                         ┌───────┐
                                         │ Print │
                                         │  min  │
                                         └───────┘
                    ┌─────────┐
                    │   End   │
                    └─────────┘
```

12. Add two nos without using arithmatic operators.

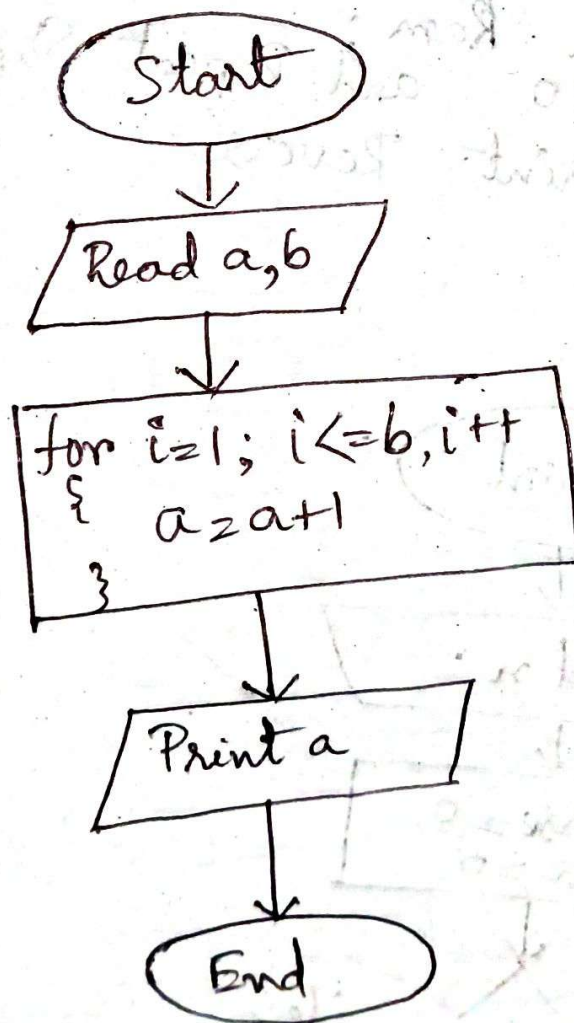Step1 : Start.

Step2 : Read input a,b.

Step3 : for (i=1; i<=b; i++)
$$a = a+1$$

Step4 : Print a

Step5 : End.

13. Reverse a given number.

Step 1 : Start.

Step 2 : Read input n.
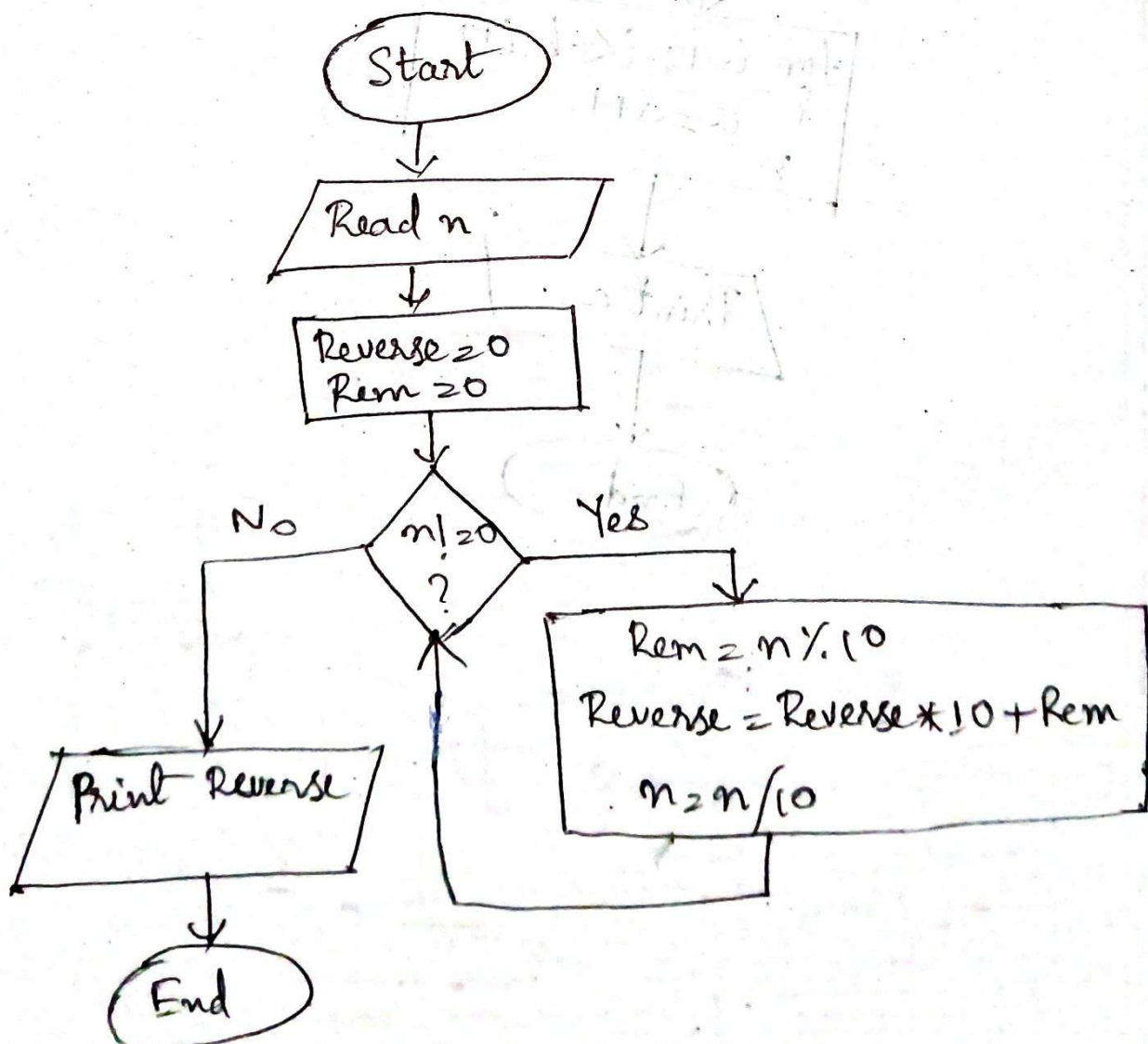
Step 3 : Reverse = 0 , Rem = 0

Step 4 : while (n! = 0)

$$Rem = n \% 10$$

$$Reverse = Reverse * 10 + Rem;$$

$$n = n/10 \quad \text{and Repeat Step 4.}$$

Step 5 : Else print Reverse

Step 6 : End.

```
        ( Start )
            |
            v
       / Read n /
            |
            v
      | Reverse = 0 |
      | Rem = 0     |
            |
            v
No  <  n! = 0 ?  >  Yes
  |                    |
  |                    v
  |         | Rem = n % 10                    |
  |         | Reverse = Reverse * 10 + Rem    |
  |         | n = n/10                        |
  v
/ Print Reverse /
            |
            v
        ( End )
```

14. Find GCD of two given numbers.

Step 1 : Start.

Step 2 : Read input x, y

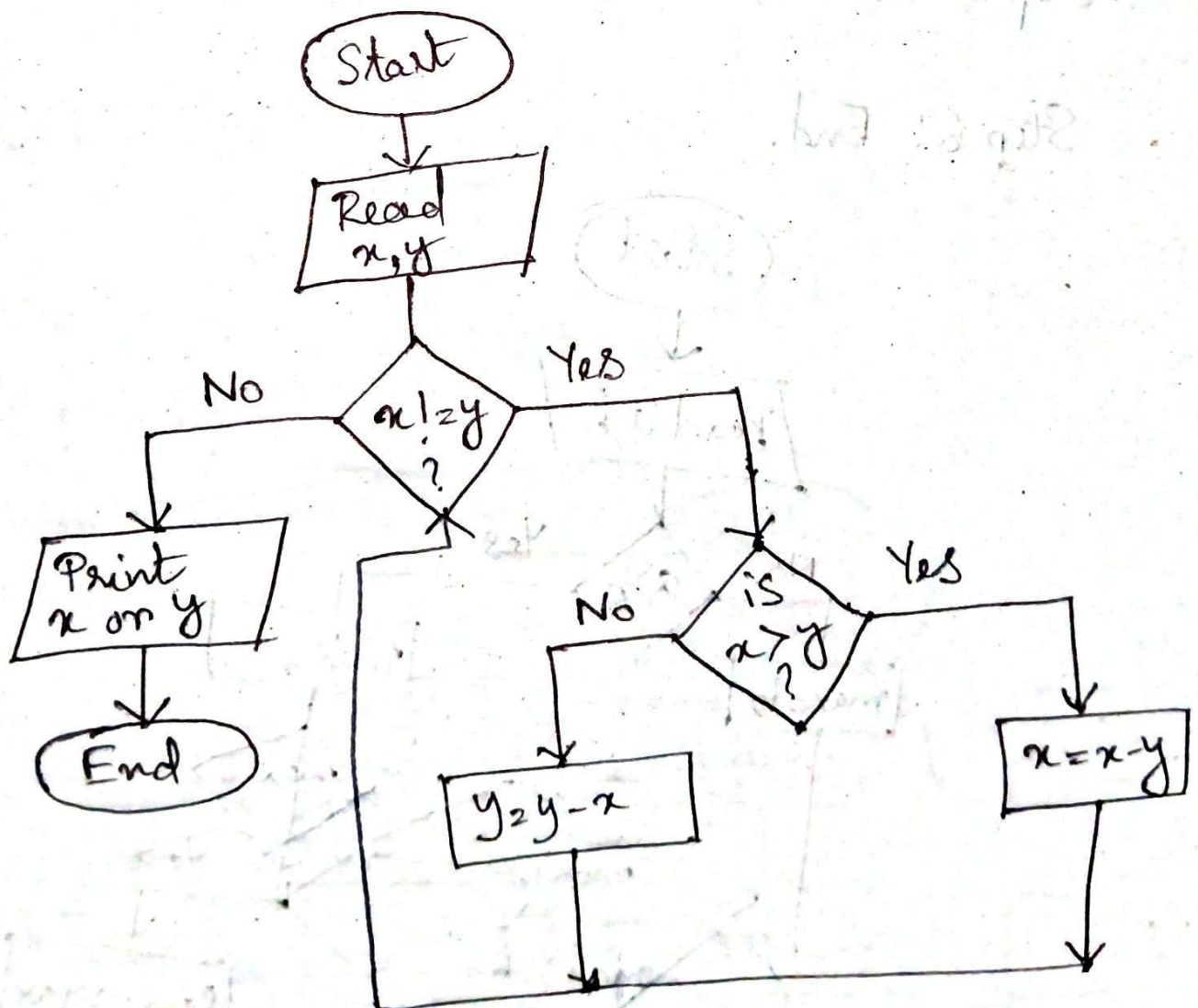Step 3 : while $(x \,! = y)$
    if $(x > y)$
        $x = x - y$,

Step 4 : else $y = y - x$,
Step 5 : Print x.
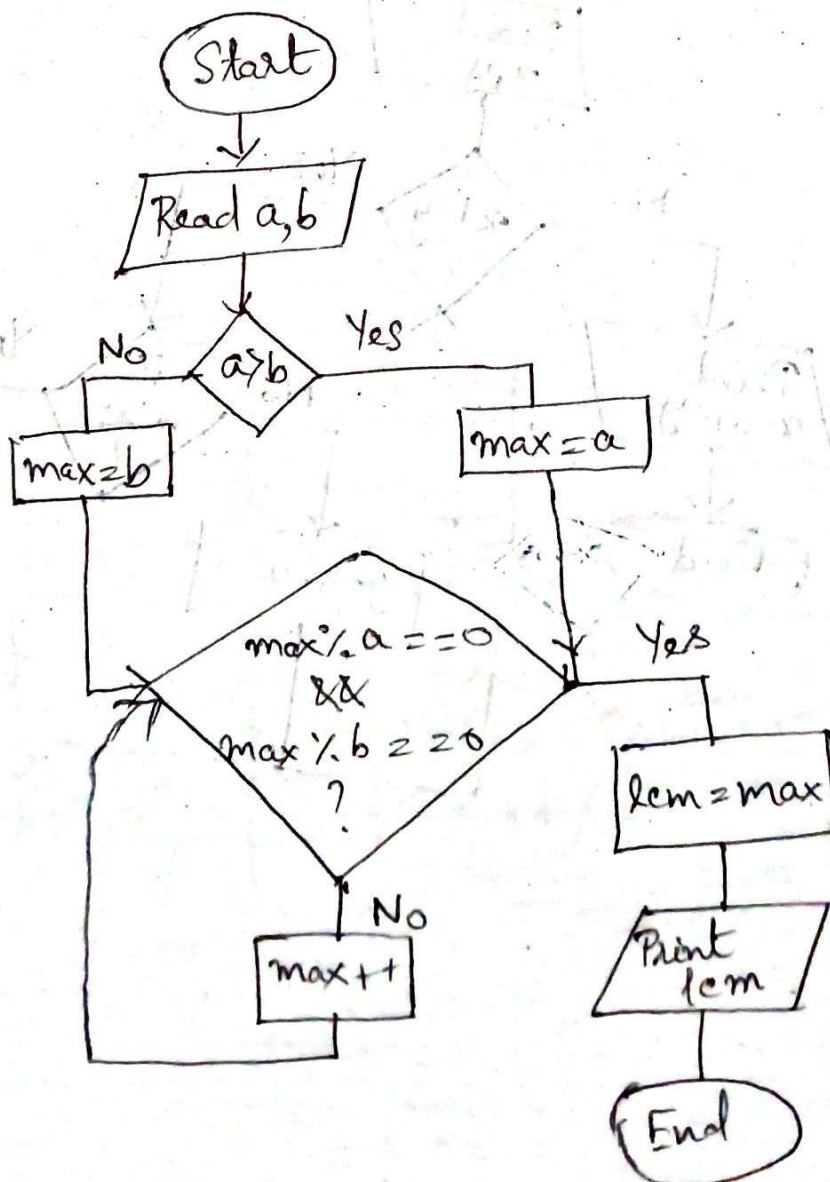Step : End.

15. LCM of Two given numbers

Step 1 : Start.

Step 2 : Read inputs a, b.

Step 3 : if a > b, max = a.
else max = b

Step 4 : if, max % a == 0 and max % b == 0
lcm = max

Step 5: else, lcm++ and repeat step 4

Step 6 : End.

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
                    ╱─────────╲
                   │  Read a,b │
                    ╲─────────╱
                         │
         No              ▼          Yes
      ◄─────────      ◇ a>b ◇      ─────────►
      │                                      │
      ▼                                      ▼
  ┌───────┐                            ┌─────────┐
  │ max=b │                            │ max = a │
  └───────┘                            └─────────┘
      │                                      │
      │                                      │
      ▼                                      ▼
          ◇ max % a == 0  ◇     Yes
          ◇      &&       ◇    ─────────►  ┌──────────┐
          ◇ max % b == 0  ◇               │ lcm = max│
          ◇      ?        ◇               └──────────┘
                  │                             │
                  │ No                          ▼
                  ▼                        ╱──────────╲
            ┌────────┐                    │   Print    │
            │ max++  │                    │    lcm     │
            └────────┘                     ╲──────────╱
                                                │
                                                ▼
                                           ┌────────┐
                                           │  End   │
                                           └────────┘
```

16. LCM of Two given numbers using Prime factors method.

Step 1 : Start.

Step 2 : Read input a,b .

Step 3 : result = 1, i = 2

Step 4 : while (i <= b)
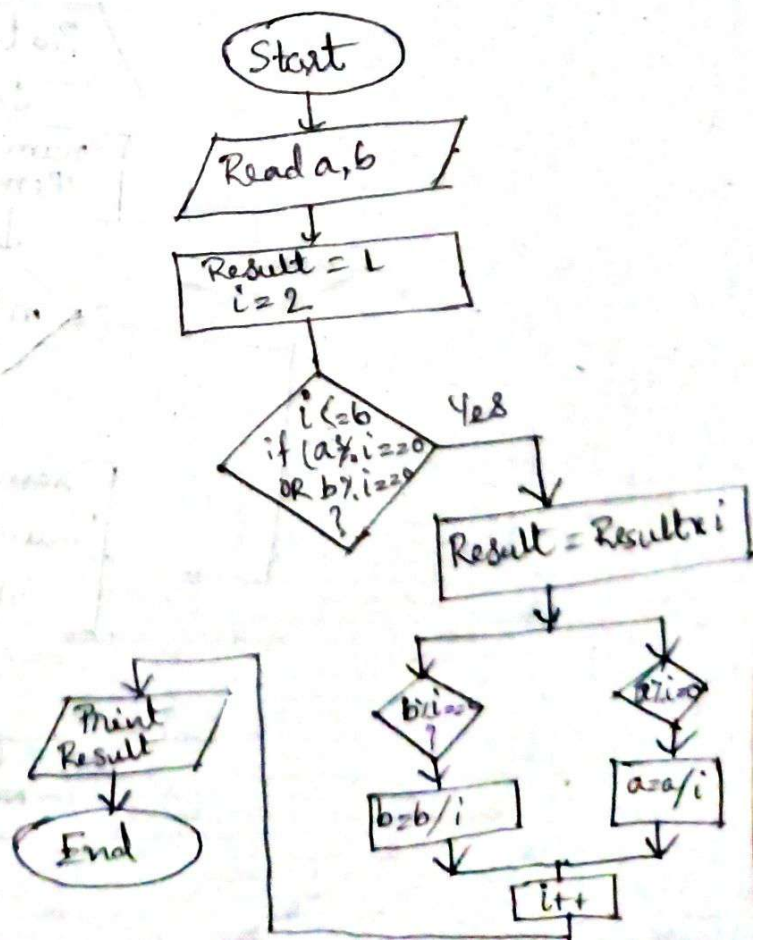$$if (a\%i == 0 \; OR \; b\%i == 0)$$
$$result = result * i$$

Step 5 : if $a\%i == 0$,
$$a = a/i$$

Step 6 : if $b\%i == 0$
$$b = b/i$$

Step 7 : i++

Step 8 : Print Result

Step 9 : End

17. Check whether a given no. is Palindrome or not.

Step 1: Start
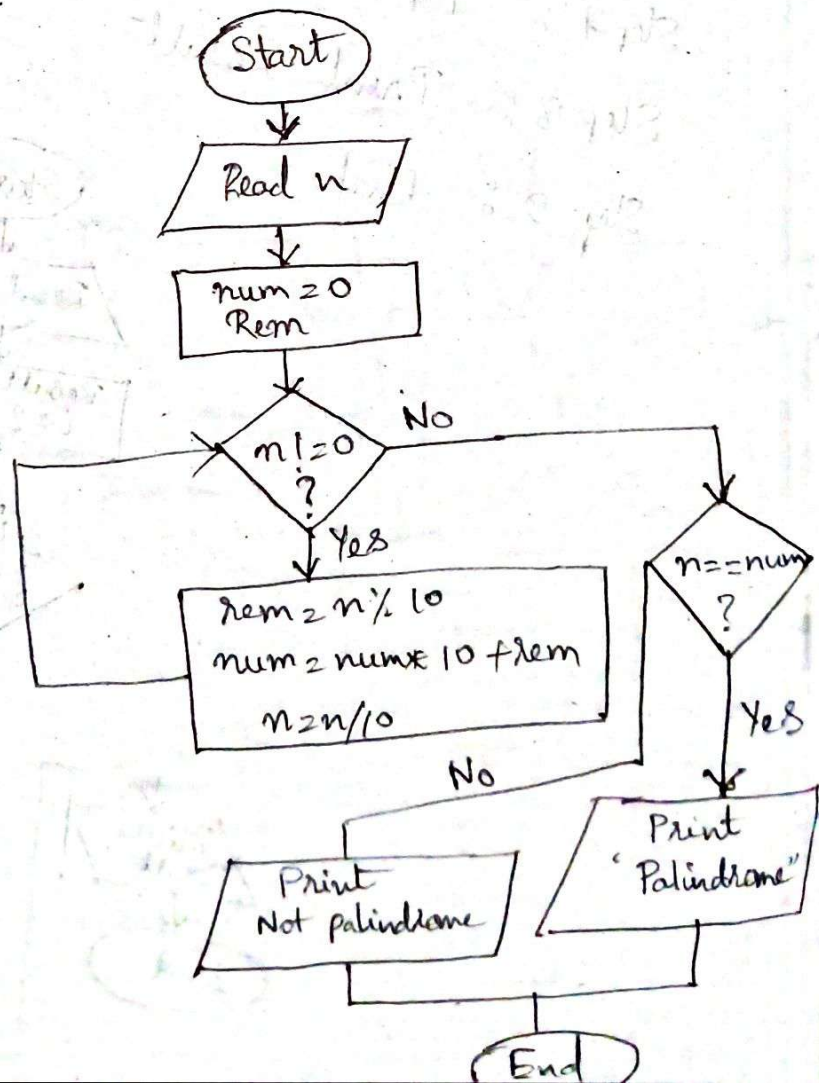
Step 2: Read input n.

Step 3: num = 0 , rem

Step 4: if (n! = 0)

$$rem = n \% 10$$

$$num = num * 10 + rem$$

$$n = n/10$$

Step 5: else if (n == num)

Print ("Palindrome")

Step 6: else Print ("Not palindrome")

Step 7: End.

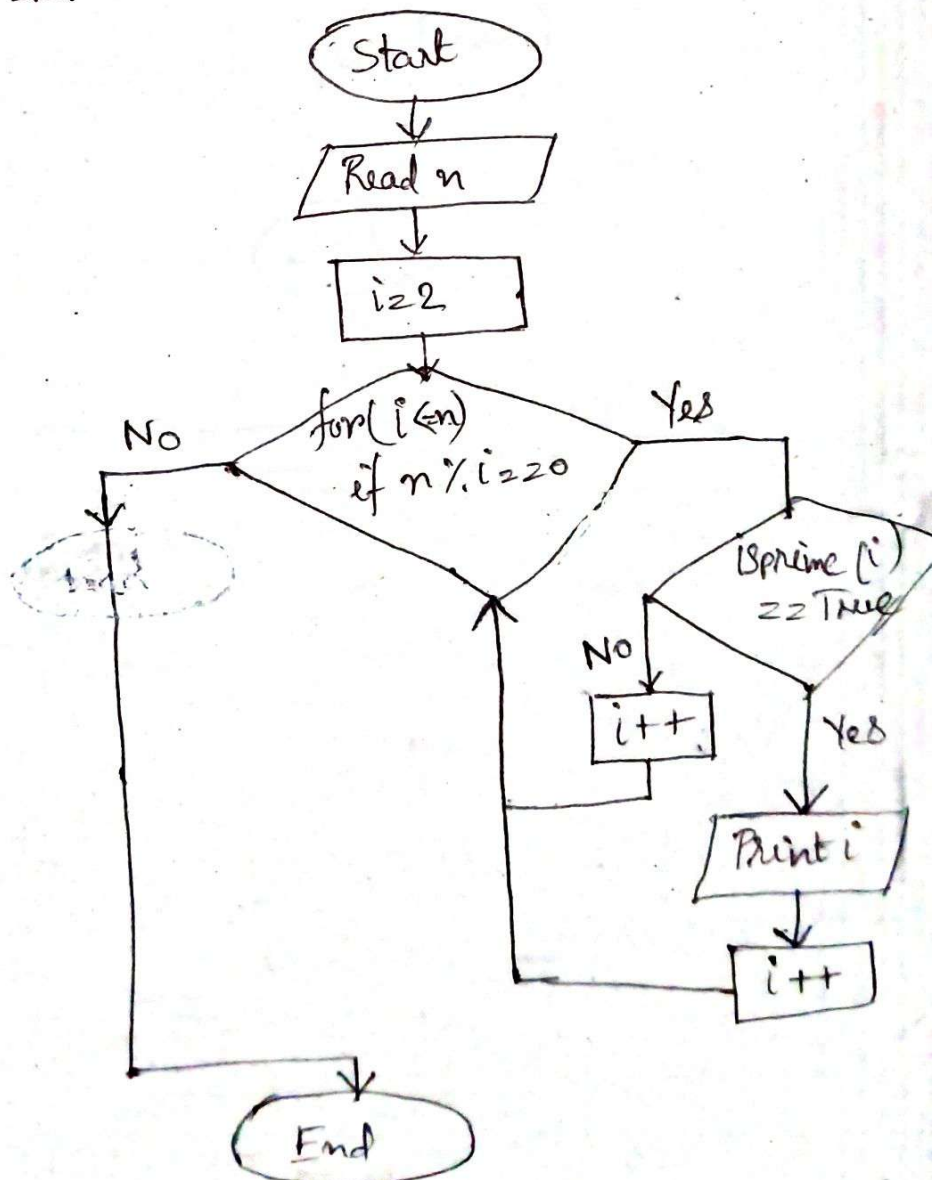18. Print all prime factors of a given no.

Step 1: Start.

Step 2: Read input n.

Step 3: i = 2

Step 4: for i < n
      if (n % i == 0)
                if isprime (i) == true
                Print i
                i++
        else:
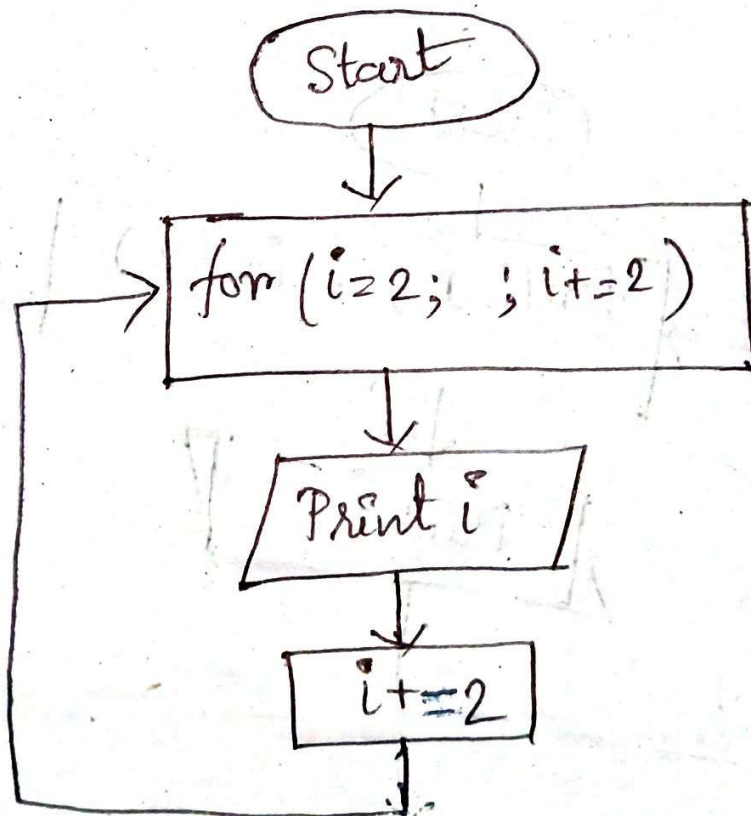   i++

Step 5: End

19. Print Even Series
            2 4 6 8 10 12 14 16 .. ...

Step1 : Start..

Step 2 : for $(i=2; \; ; i+=2)$
              Print i

Step 3 : End

20. Print odd no. series

   1   3   5   7   9   11   13 . . .

Step 1 : Start

Step 2 : for (i = 1 ;   ; i += 2)
            Print i