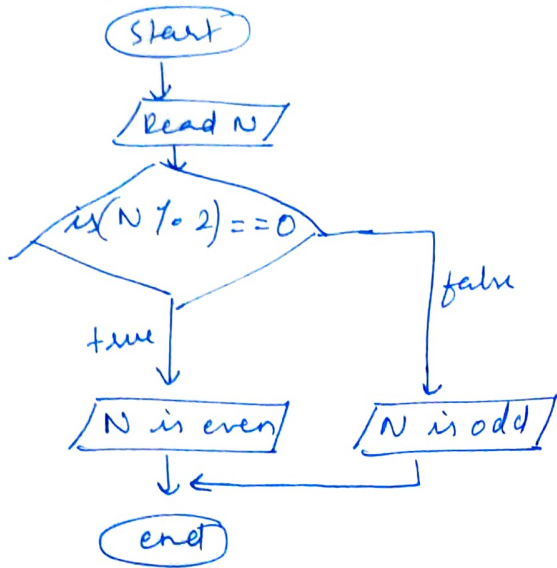# Assignment - L

1) Check if given number is EVEN or ODD

```
        ( Start )
            |
            v
      / Read N /
            |
            v
      / is(N % 2)==0 \-------
      \              /       | false
       true|                 |
           v                 v
     / N is even /     / N is odd /
           |                 |
           v<----------------
        ( end )
```

2) Write a Java program to find factorial of a given number

```
        ( Start )
            |
            v
      / Read n /
            |
            v
      | int ans = 1 |
            |
            v
          /  is  \
         /  n > 1 \<--------
         \    ?   /         |
   false  \      /  true    |
     |      | yes |         |
     |          v           |
     |    | ans = ans * n |--
     |    |   n --       |
     v
  / output ans /
     |
     v
  ( end )
```
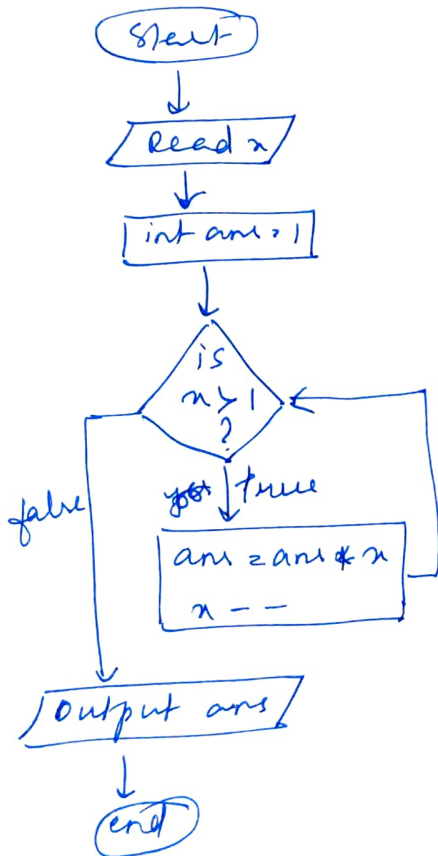
3) Find the factorial of a number using recursion

```
        Start                              m1(num)
          │                                   │
          ▼                                   ▼
     /Read num/                        if (num == 0
          │                      true    or num == 1)
          ▼                      ┌──────────┤
   int n = m1(num)               │          │ false
          │                      ▼          ▼
          ▼                   return 1    return (num * m1(num-1))
     /output n/
          │
          ▼
         end
```
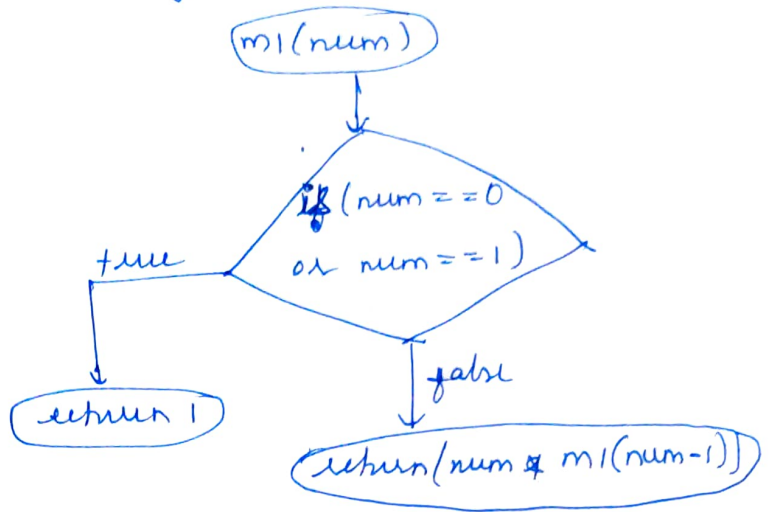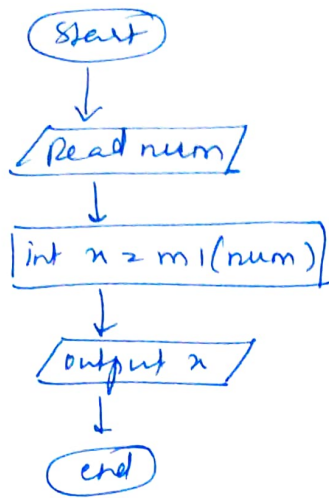
4) Swap two numbers without using third variable approach

```
           Start
             │
             ▼
    /Read num1 & num2/
             │
             ▼
    ┌────────────────────┐
    │ num1 = num1 + num2 │
    │ num2 = num1 - num2 │
    │ num1 = num1 - num2 │
    └────────────────────┘
             │
             ▼
   /output num1 & num2/
             │
             ▼
            end
```
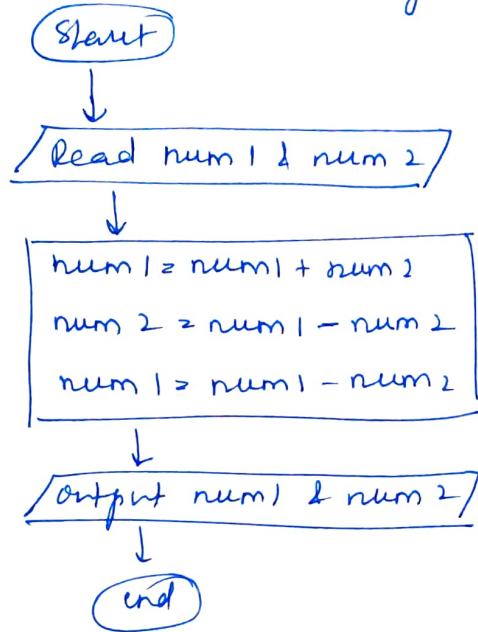
5) How to check whether the given number is positive or negative in Java?

```
              Start
                │
                ▼
           /Read num/
                │
                ▼
    true      ╱ is ╲      false
   ┌─────────⟨ num>=0 ⟩─────────┐
   │          ╲    ╱            │
   ▼                            ▼
/output                    /output
num is positive/           num is negative/
   │                            │
   └──────────┬─────────────────┘
              ▼
             end
```
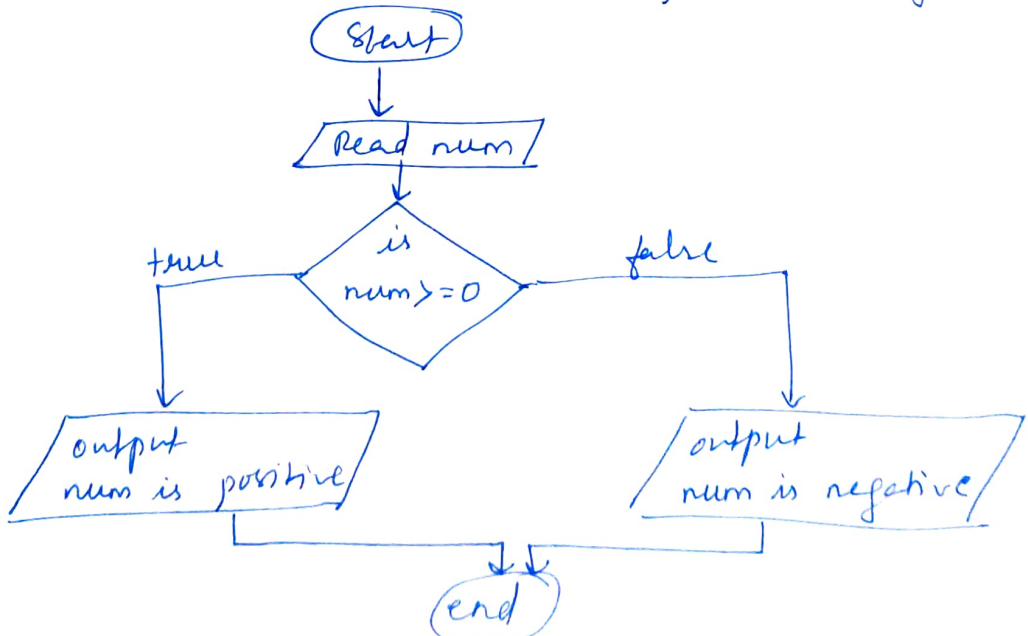
6) Write a Java program to find whether a given number is leap year or NOT.

```
          ( Start )
              |
         / Read num /
              |
          /¯¯¯¯¯¯¯\
         /   Is    \
        /  n % 4 ==0 \------ false ------------------------------┐
        \   and      /                                          |
         \   is      /                                          ↓
          \ n %100!=0/                                      /¯¯¯¯¯¯\
           \¯¯¯¯¯¯¯/                                       /   Is    \
              |                                 true ----<  n%100==0  >---- false
            true                                    |      \¯¯¯¯¯¯/          |
              |                                     ↓                        ↓
      / output num is a /                       /¯¯¯¯¯¯\           / output num /
      /   leap year     /                      /   Is    \         / is not leap /
              |                         false /  n%400==0 \        /    year     /
              |                         ┌----<             >----┐
              |                         ↓     \¯¯¯¯¯¯/     |
              |                 / Output num /            true
              |                 / is not leap/             ↓
              |                 /    year    /      / output num a /
              |                                     / is leap year /
              |                         |              |              |
              ↓<-------------------------------------------------------
           ( end )
```
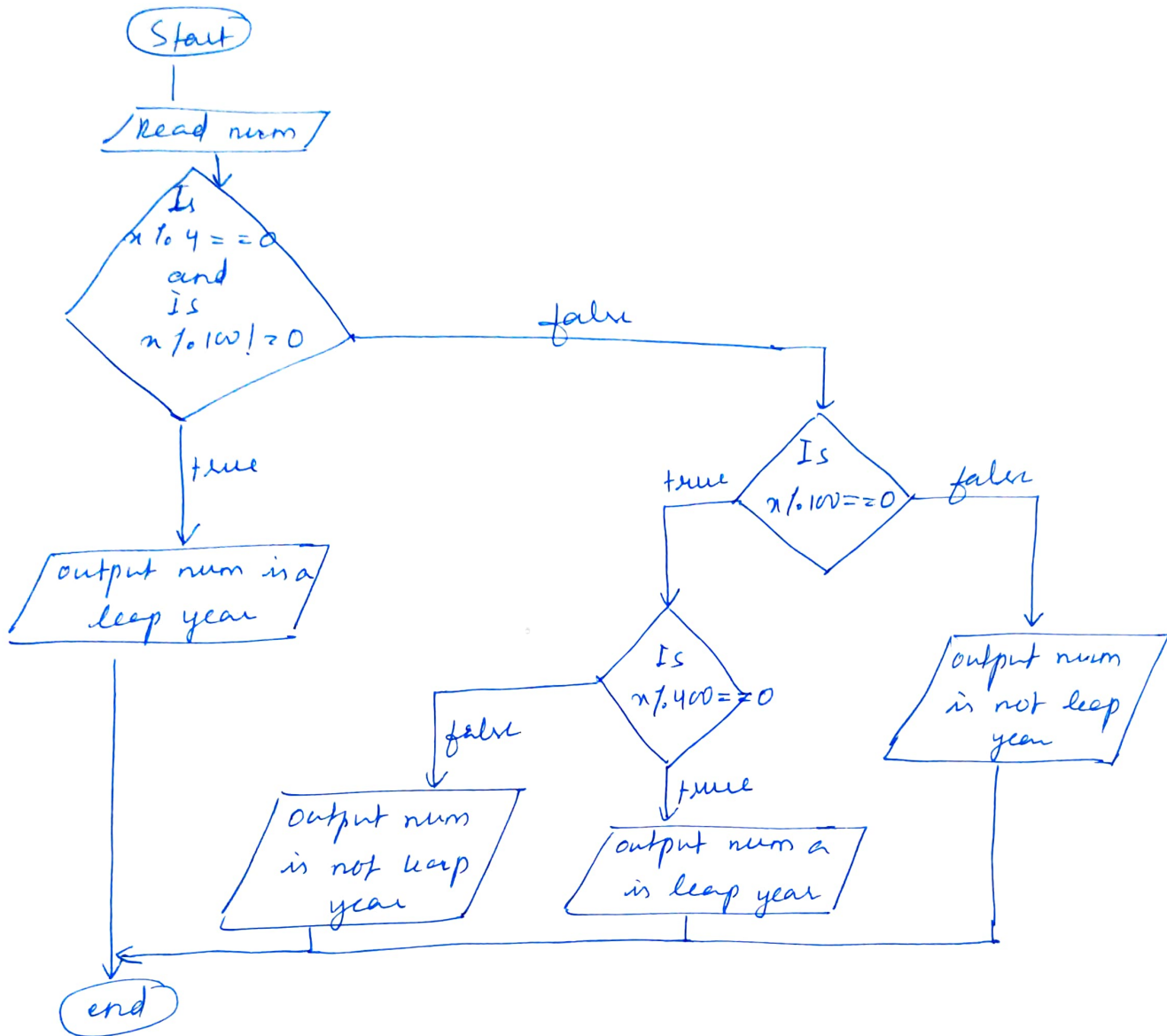
7) Write a Java program to print 1 to 10 without using loop

```
              ( Start )
                  |
              [ int n = 1 ]
                  |
              [ m1(n) ]<--------┐
                  |             |
               /¯¯¯¯\           |
              /  is   \         |
    true ----<  n > 10 >        |
      |        \¯¯¯¯/           |
      |           |             |
      |         false           |
      |           ↓             |
      |      / output n /       |
      |           |             |
      |        [ ++ n ]---------┘
      └----→ ( end )
```
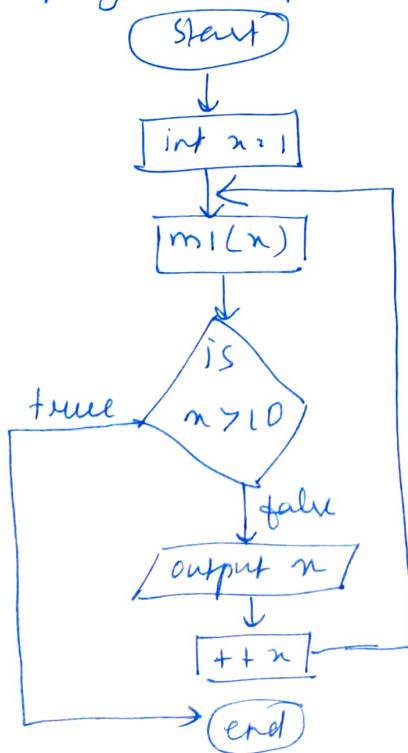
8) Write a Java program to print digits of a given number.

Start

Read n

temp = 1
rev = 0

is n > 0   false

true

temp = n % 10
rev = (rev * 10) + temp
n = n / 10

is rev > 0   false

true

temp = rev % 10
rev = rev / 10

output temp

end
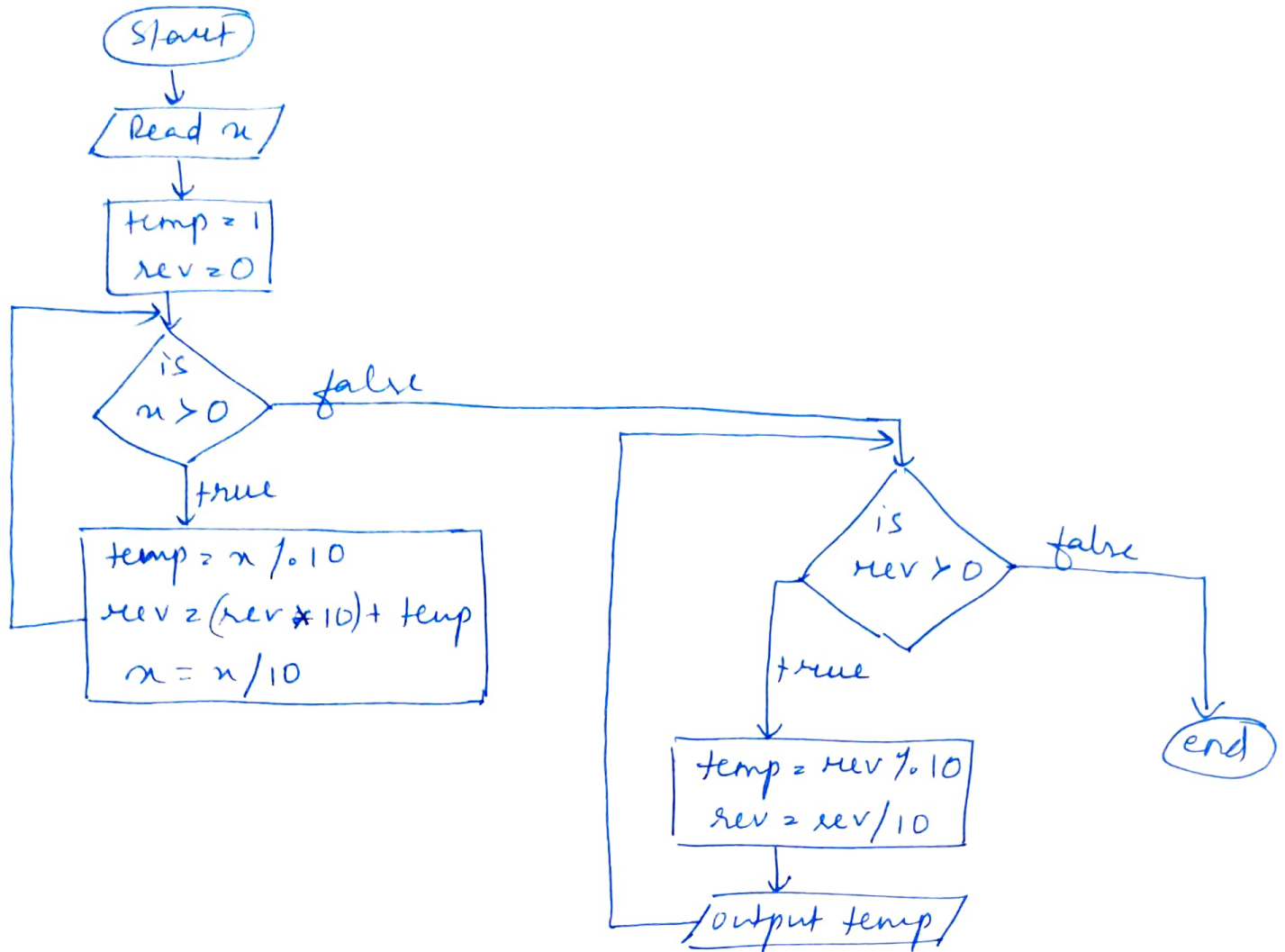
9) Write a Java program to print all the factors of a given number.

Start

Read num

int i = 1

is i <= num
false
true

is num%i == 0
false
true

output i

i++

end
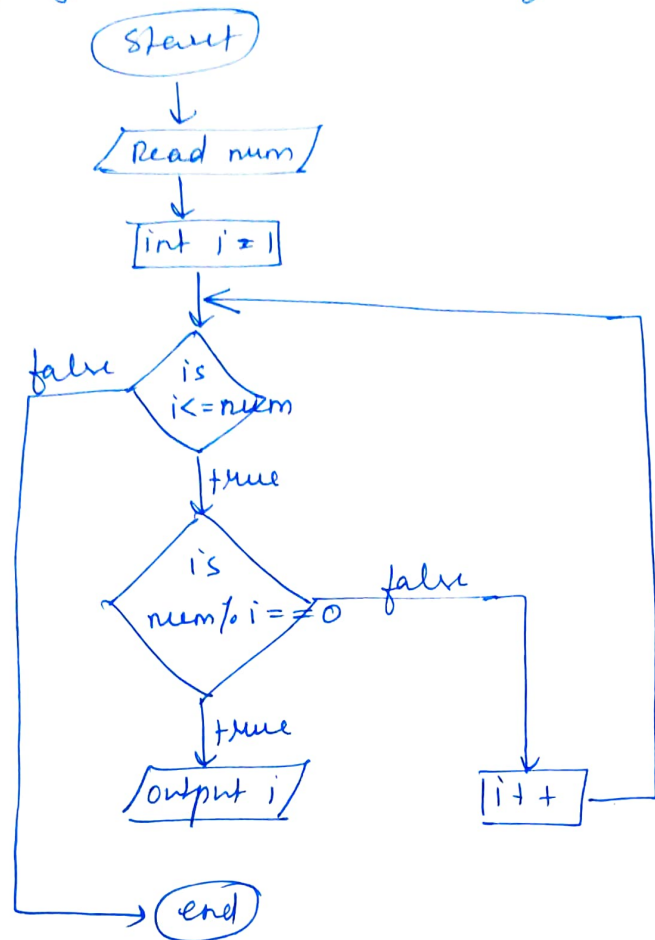
10) Write a Java program to find the sum of the digits of a given number.

Start

Read n & y

ans = 0
temp = 0
carry = 0

is (x > 0) or (y > 0) or (carry > 0)
false
true

output = 0
temp = 1

is ans > 0
true
false

i = ans %. 10
output = (output * 10) + i
ans = ans / 10

temp = (x %. 10) + (y %. 10) + carry
ans = (ans * 10) + (temp %. 10)
carry = temp / 10
n = n / 10
y = y / 10

Output output

end
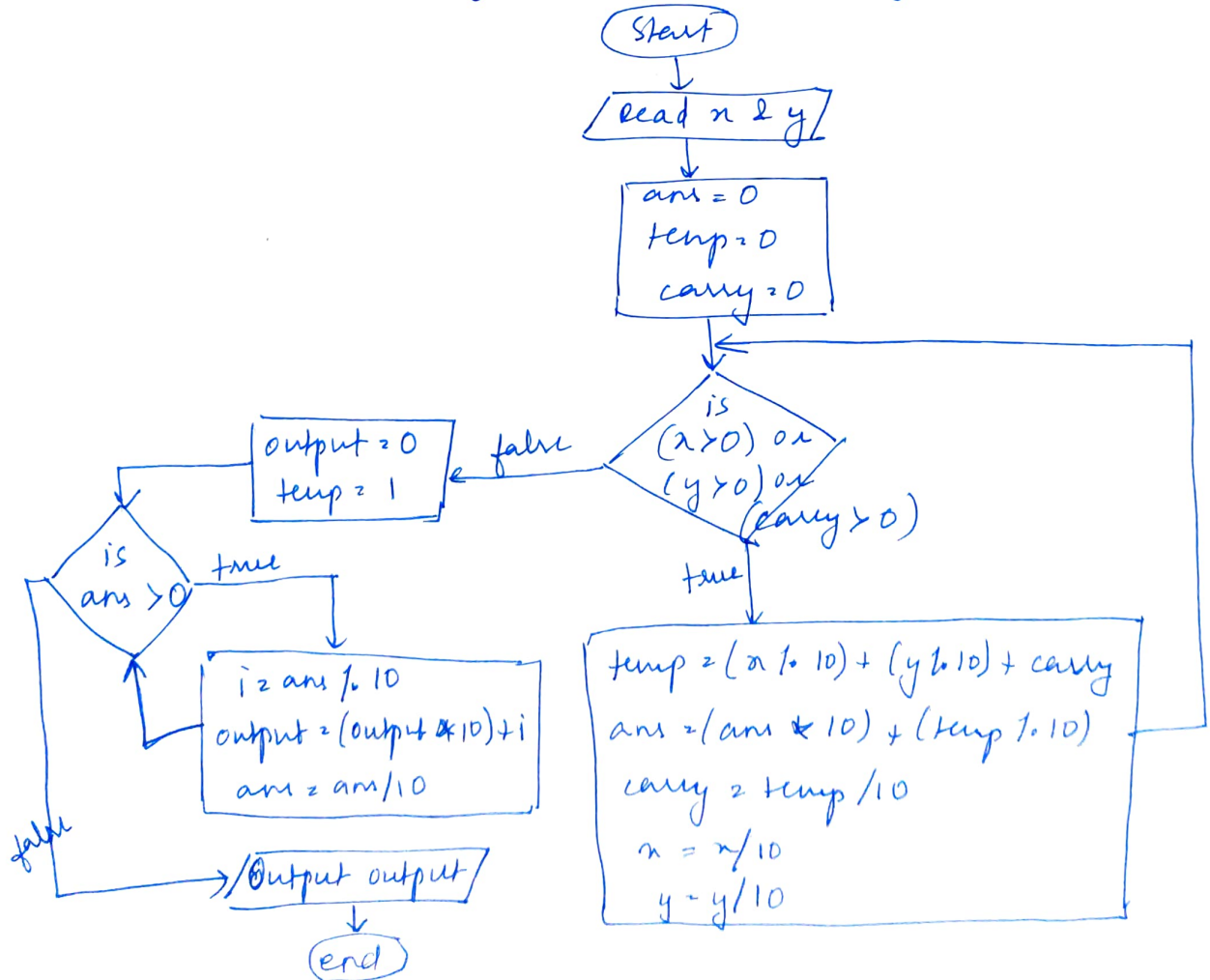
1) Write a Java program to find smallest of 3 numbers (a,b,c)

```
                    ( Start )
                        |
                 [ Read a, b, c ]

       false            is            true
    ┌───────────────< a>b >───────────────┐
    │                                       │
    ▼                                       ▼
true  is  false                     true  is  false
┌──< b>c >──┐                    ┌──< a>c >──┐
│           │                    │           │
▼           ▼                    ▼           ▼
[output b] [output c]         [output a]  [output c]
    │           │                    │           │
    └───────────┴──────────┬─────────┴───────────┘
                       ( end )
```
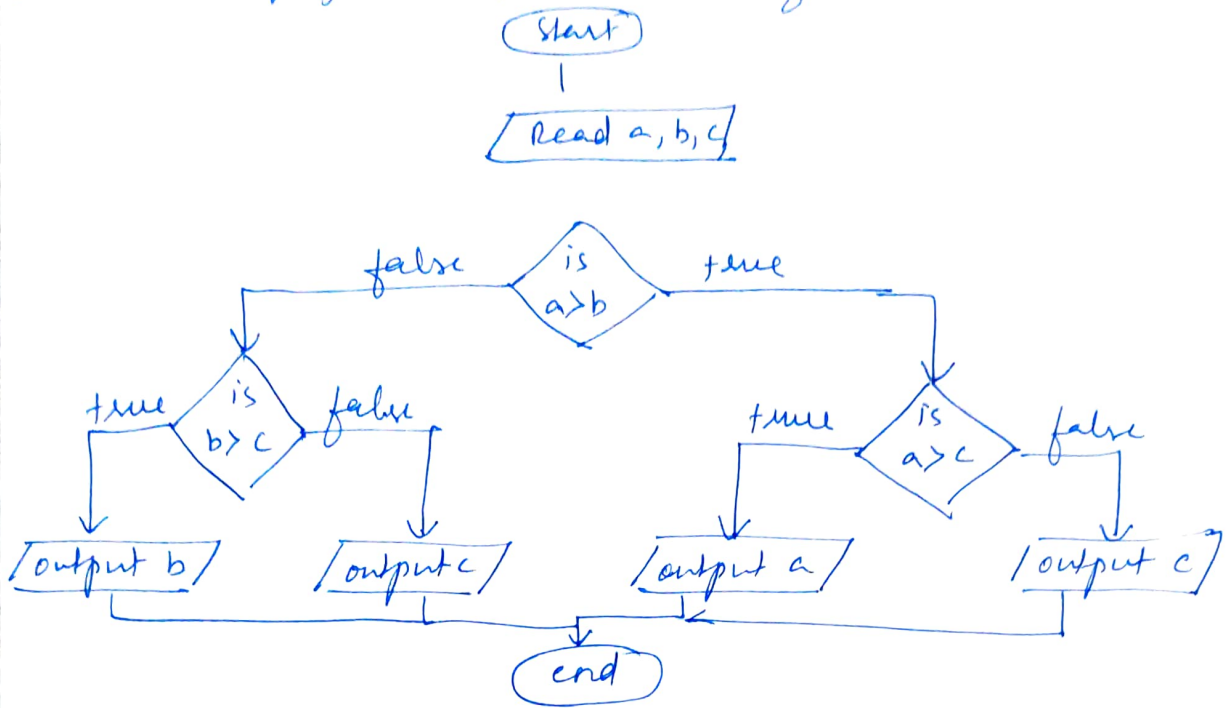
2) How to add two numbers without any arithmetic operators in Java?

```
              ( Start )
                  │
       [ Read num1 & num2 ]
                  │
             [ int i=1 ]
                  │
                  ▼
        false     is
    ┌──────< i<= num2 >
    │             │
    │             │ true
    │             ▼
    │      num1++  num1++
    │          i++
    │             │
    │─────────────┘
    ▼
[ output num1 ]
    │
 ( end )
```
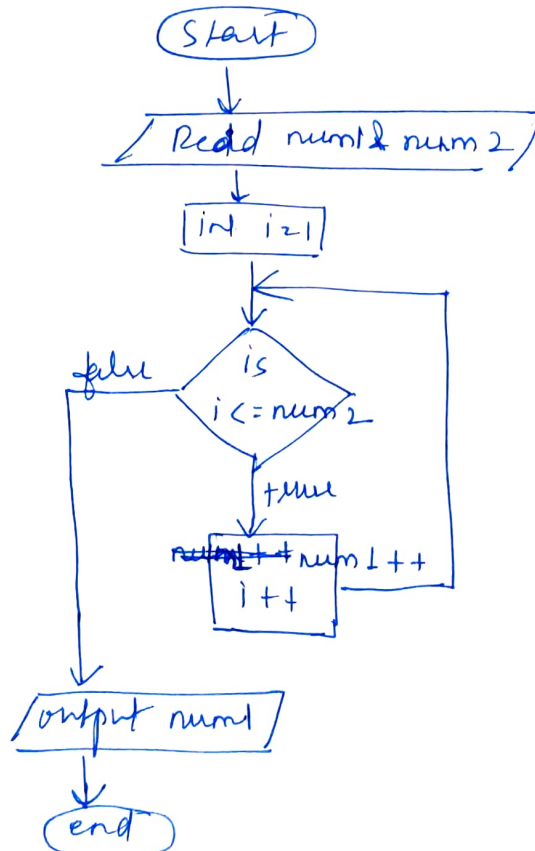
13) Write a java program to reverse a given number

Start

Read i

ami = 0
n = 1

is
i > 0

false → output ams → end

true

$n = i \% 10$
$ams = (ams * 10) + n$
$i = i/10$
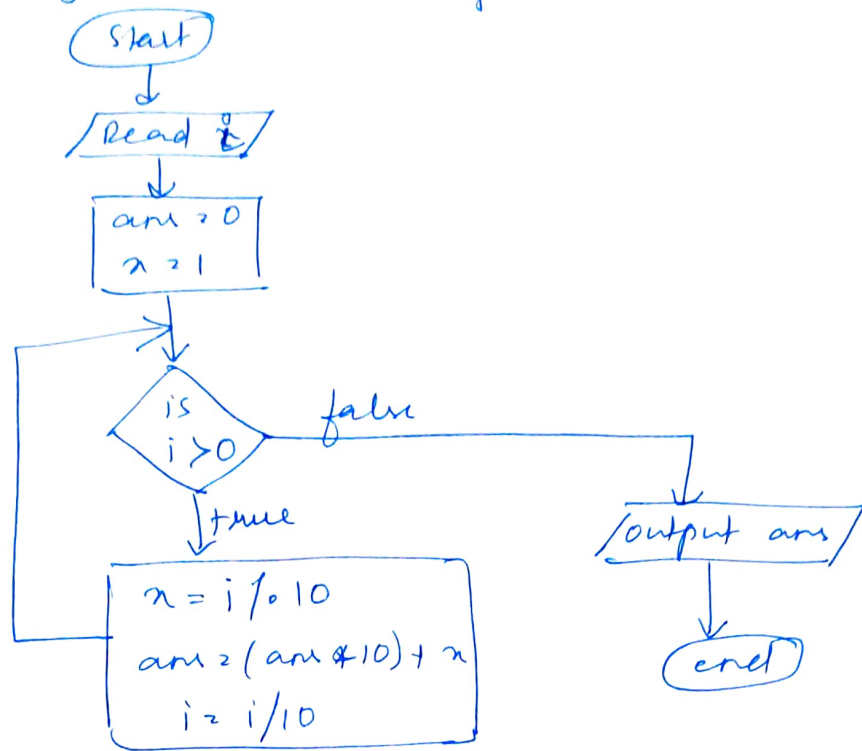
14) Write a java program to find GCD of two given numbers

Start

Read n & y

is
$n != y$

false → output n → end

true

is
$n > y$

true → $n = n - y$

false → $y = y - n$
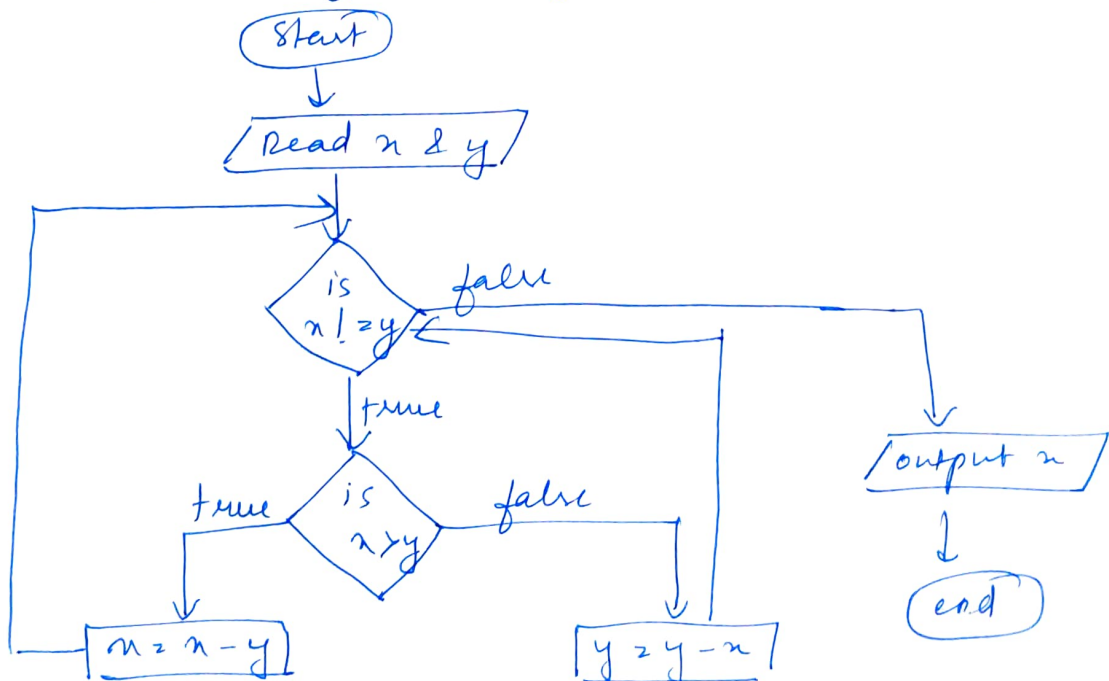
15) Write a Java program to find LCM of two given numbers

Start

Read x & y

i = x
j = y

is x != y   ——false——→   LCM = (i * j)/x
   | |
  true   Output LCM
   | |
is x > y   ——false——┐   end
   | |
  true |
x = x - y   y = y - x
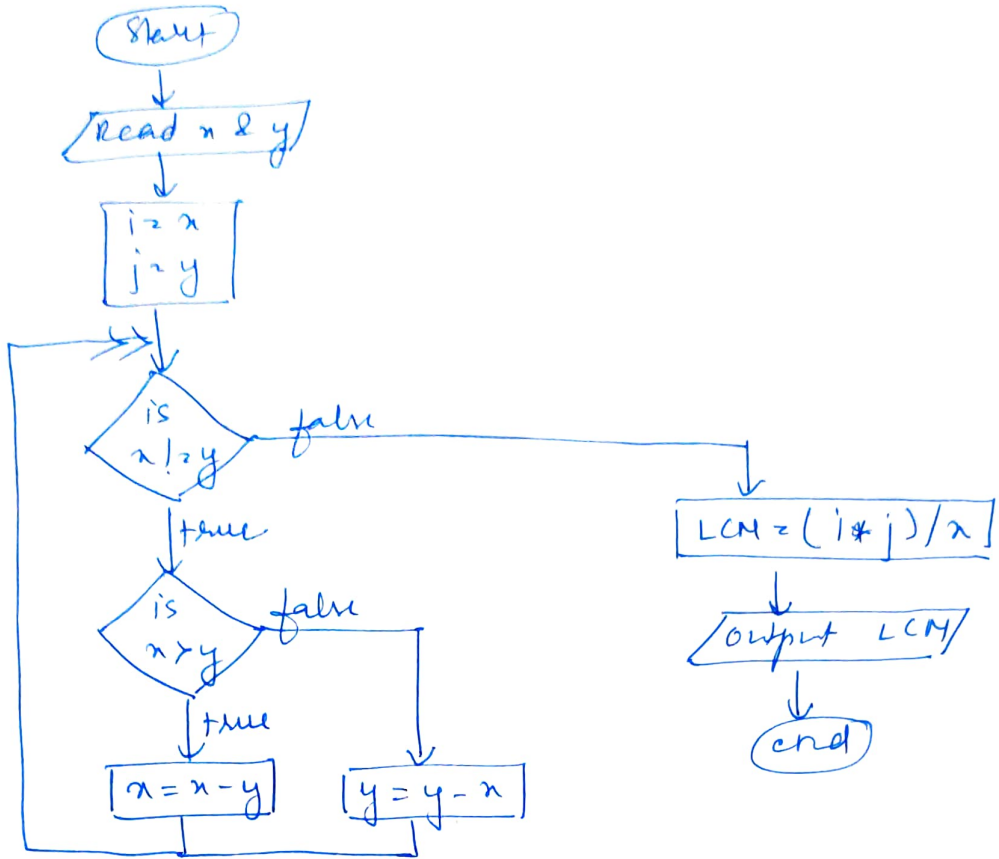
7) Check whether the given number is Palindrome or not

Start

Read n

temp = 1
y = n
rev = 0

is n > 0   ——false——→   is rev == y   ——false——→   output not palindrome
   | | |
  true   true   end
temp = n % 10   output palindrome
rev = (rev * 10) + temp
n = n/10
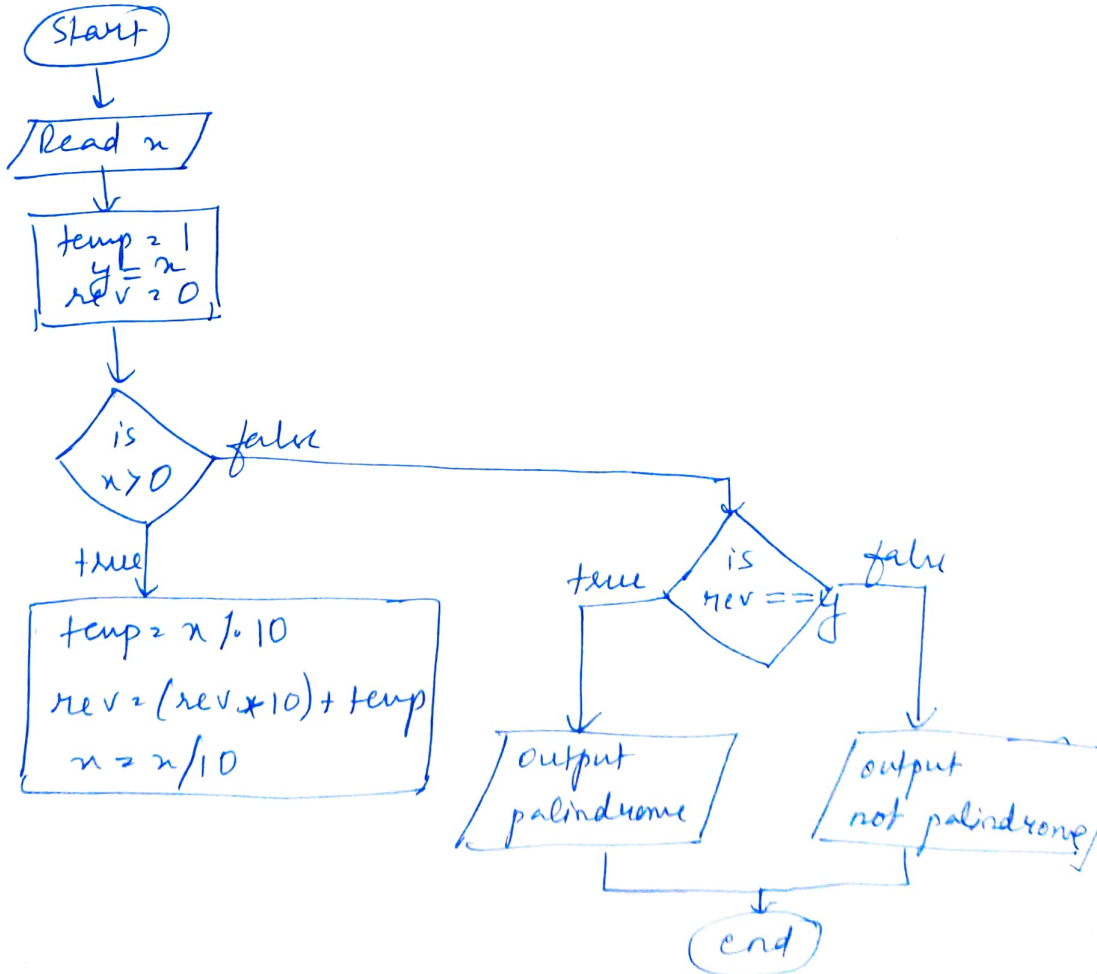
18) Write a Java program to print all prime factors of the given number

Start

```
Read n
```
↓
```
i = 1
```
↓

is i <= n
- false → end
- true ↓

is prime(i) true and (n % i) == 0
- false → i++
- true ↓
```
output i
```
→ i++ → (loops back to is i <= n)

→ **end**

prime(num)

```
Set i = 2
```
↓

is i < num
- false → return true
- true ↓

is num % i == 0
- false → i++ → (loops back to is i < num)
- true ↓
return false
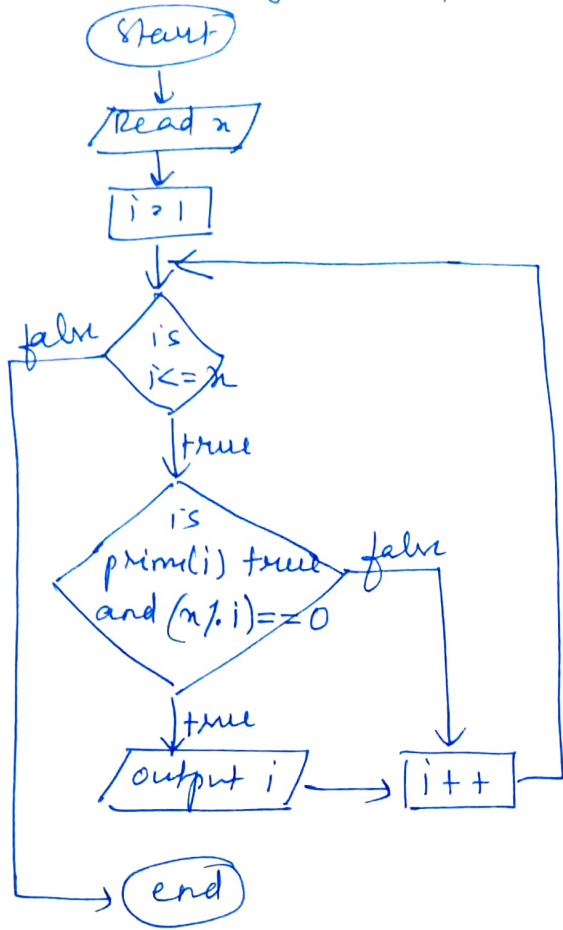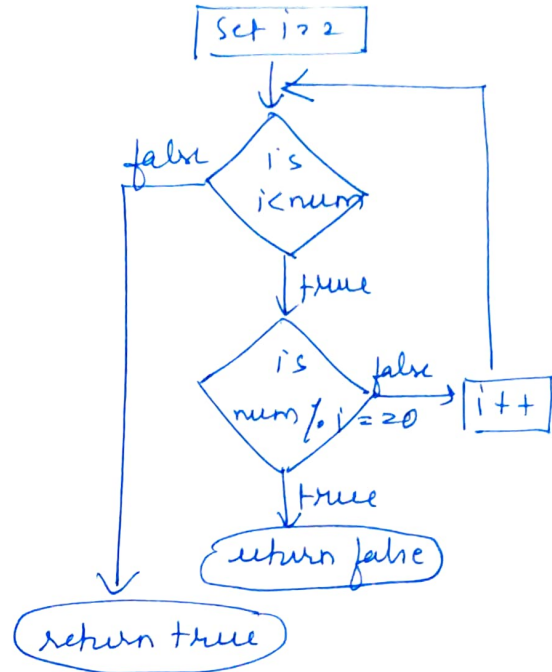
19) To print following EVEN number series 2 4 6 8 10 12 14 ....

Start
↓
```
i = 0
```
↓

is i % 2 == 0
- false → i++
- true ↓
```
output i
```
→ i++ → (loops back)
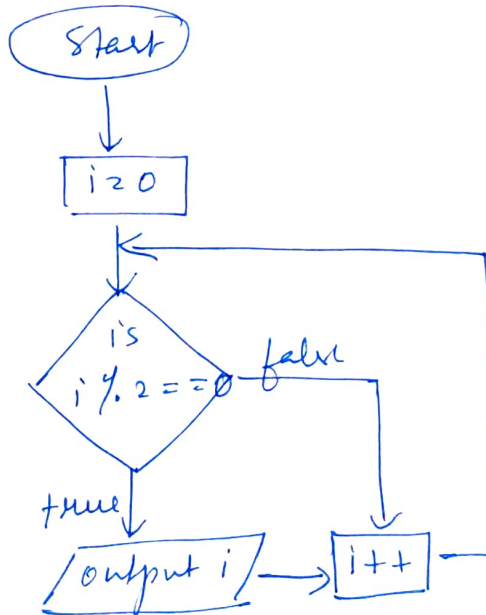
20) To print following ODD number series 1 3 5 7 9 11 13 ...

```
        ┌─────────┐
        │  Start  │
        └─────────┘
             │
             ▼
        ┌─────────┐
        │  i = 0  │
        └─────────┘
             │◄──────────────────────────┐
             ▼                            │
          ╱─────────╲                     │
         ╱    is     ╲      false         │
        ╱  i % 2 != 0 ╲────────┐          │
        ╲             ╱        │          │
         ╲───────────╱         │          │
             │                 │          │
           true                │          │
             ▼                 ▼          │
      ╱───────────╱       ┌─────────┐     │
     ╱  output i ╱───────►│   i++   │─────┘
    ╱───────────╱         └─────────┘
```