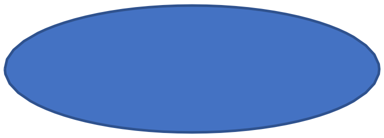
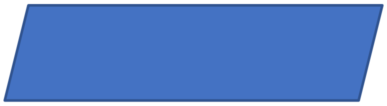
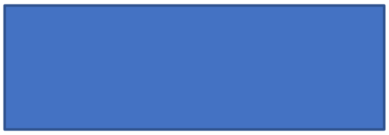
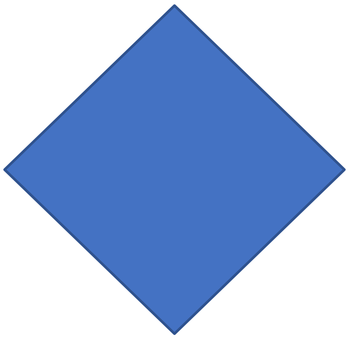
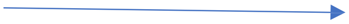
FLOW OF THE PROGRAM

Flow Chart:- Visualization of our thought process or Algorithm and represent them diagrammatically is called flow chart.

Symbols to Be used in flow chart

1. Start / Stop - 
2. Input / Output - 
3. Processing - 
4. Condition - 
5. Flow direction of program - 

Start / Stop: - An ovel shape indicate the starting and ending points of the flow chart.

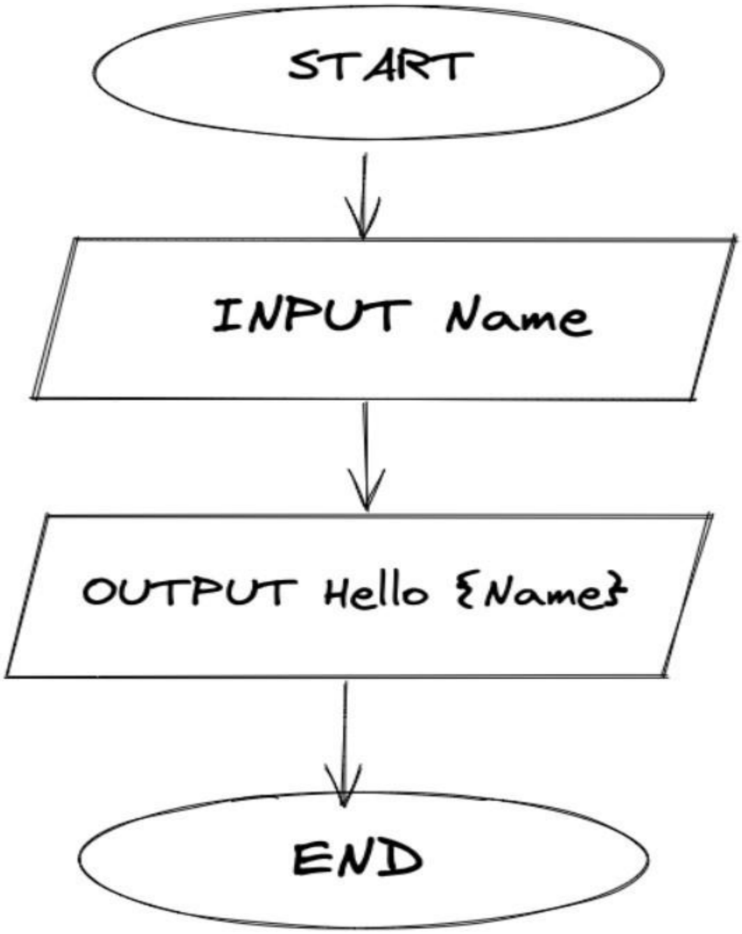
Input / Output: - A parallelogram is used to represent Input and output in flow chart

Processing: - A rectangle is used to represent process such as mathematical computation or variable assignment.

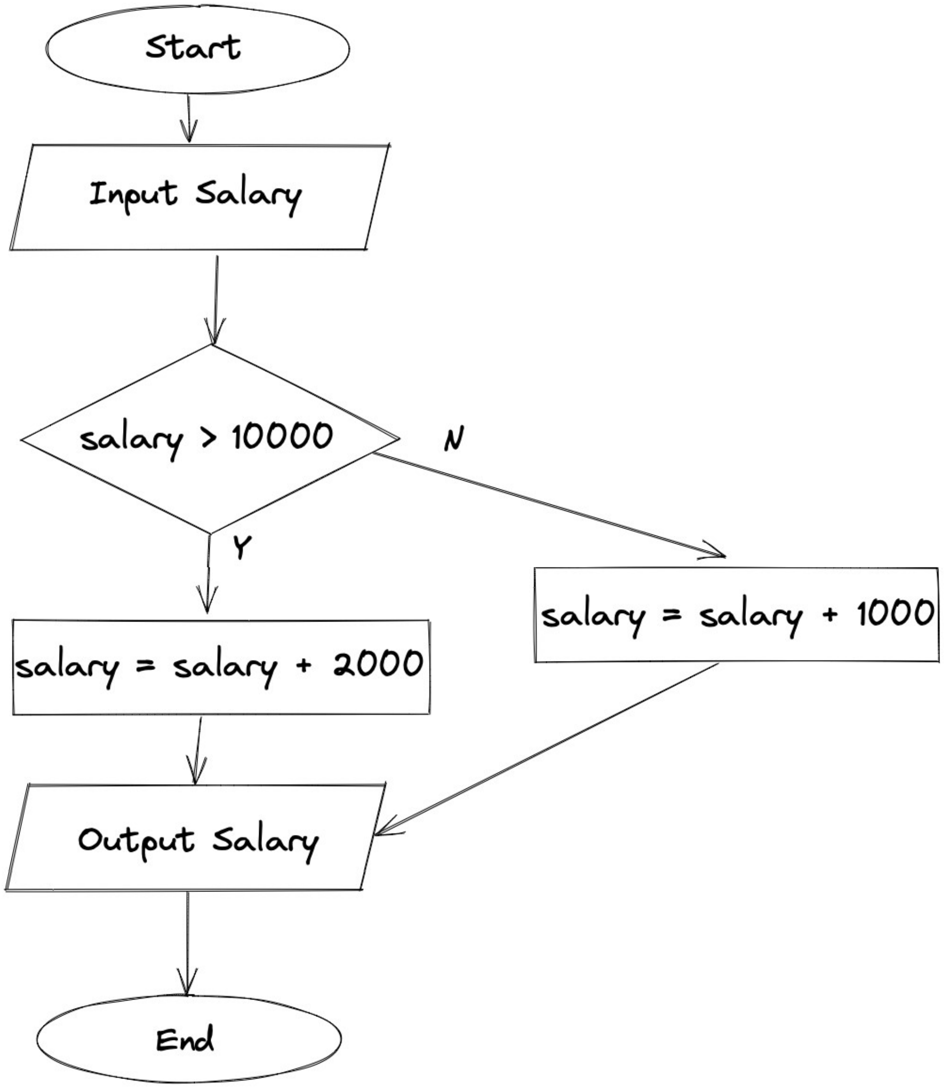
Condition: - A diamond shape is used to represent conditional statement which results in true or false (Yes or No).

Flow direction of program: - An arrow shape is used to represent flow of the program.

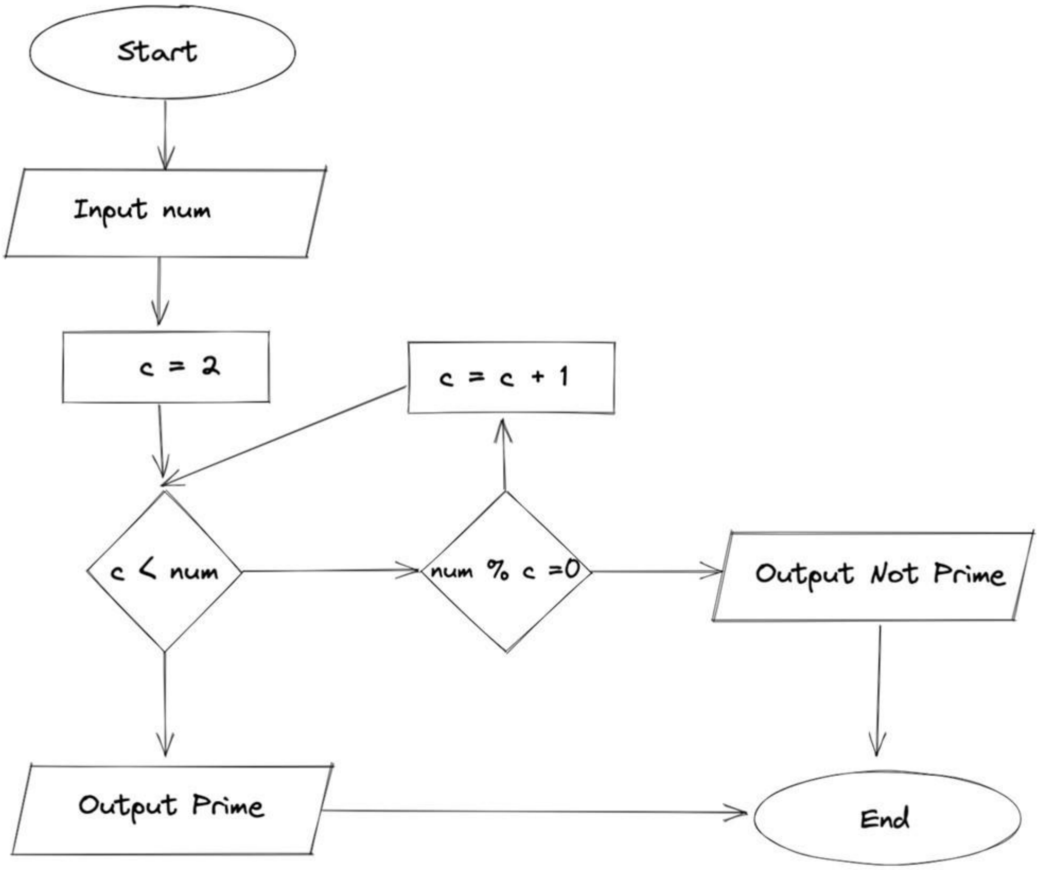
Example 1 :- Take a name and output Hello name.



Example 2 :- Take input of a salary. If the salary is greater than 10,000 add bonus 2000, otherwise add bonus as 1000.



Example 3 :- Input a number and print whether it is prime or not.



Pseudocode :- It is like a rough code which represents how the algorithm of a program works.

- Pseudocode does not require syntax.

Pseudocode of Example 2

```
Start
Input Salary
if Salary > 10000 :
    Salary = Salary+2000
else :
    Salary = Salary+1000
Output Salary
exit
```

Pseudocode of Example 3

```
Start
Input num
if num ≤ 1
   print “Nither prime nor composite”
c = 2
while c < num
   if num % c = 0
        Output “Not Prime”
        Exit
   c = c+1
end while
Output “Prime”
Exit.
```

Optimization of prime solution

Let's have a number to check it's a prime number of not

36

$$1 \quad \times \quad 36 \quad = \quad 36$$

$$\left[\begin{array}{ccccc} 2 & \times & 18 & = & 36 \\ 3 & \times & 12 & = & 36 \end{array}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(i)}$$

$$4 \quad \times \quad 9 \quad = \quad 36$$

$$6 \quad \times \quad 6 \quad = \quad 36$$

$$9 \quad \times \quad 4 \quad = \quad 36$$

$$\left[\begin{array}{ccccc} 12 & \times & 3 & = & 36 \\ 18 & \times & 2 & = & 36 \end{array}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(ii)}$$

$$36 \quad \times \quad 1 \quad = \quad 36$$

In the above demonstration we have clearly seen that (i) and (ii) are repeated so, to optimize this we can ignore the (ii)

As same as this

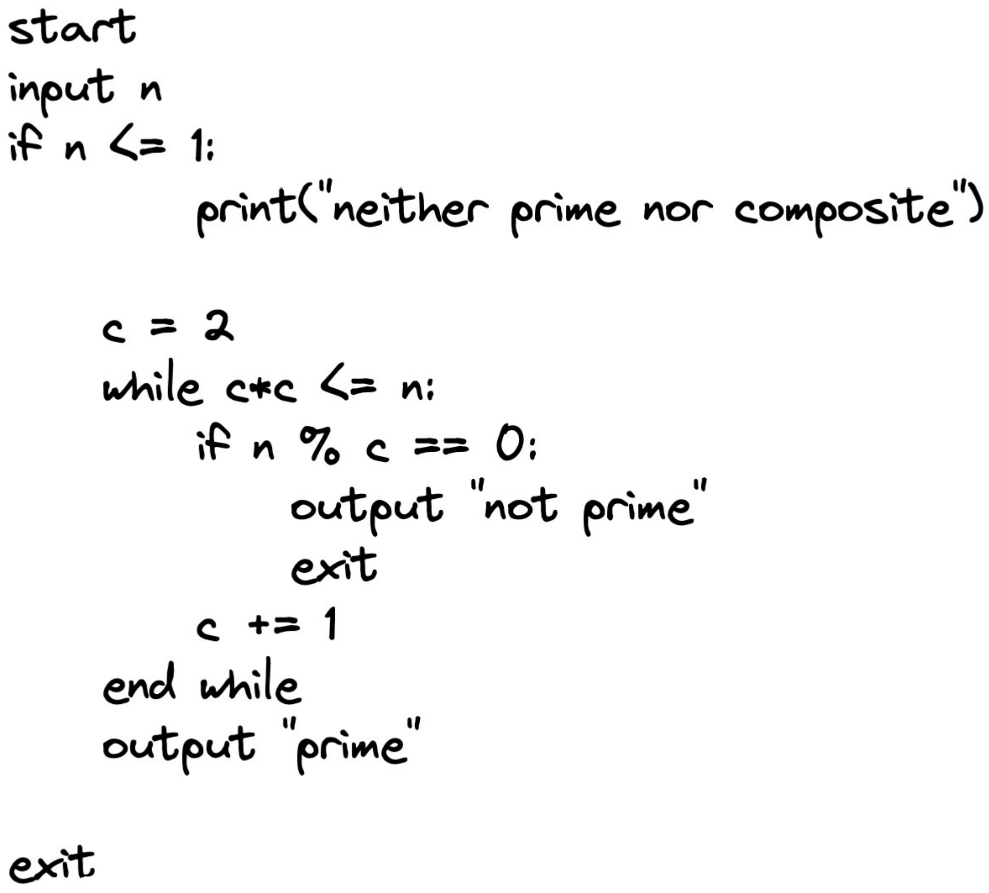
We can check the number is prime or not by travelling form

$2 \quad to \quad \sqrt{number}$

For example:-

- **To check 23456786543 is prime or not, we only have to travel from** $2 \quad to \quad \sqrt{23456786543} \quad (i.e. \quad 153156)$
- **To check 17 is prime or not, we do not have to travel from 2 to 17 we just have to travel from 2 *to* √17 (i.e. 4)**

Optimized Pseudocode of Example 3



```
start
input n
if n <= 1:
        print("neither prime nor composite")

    c = 2
    while c*c <= n:
        if n % c == 0:
            output "not prime"
            exit
        c += 1
    end while
    output "prime"

exit
```