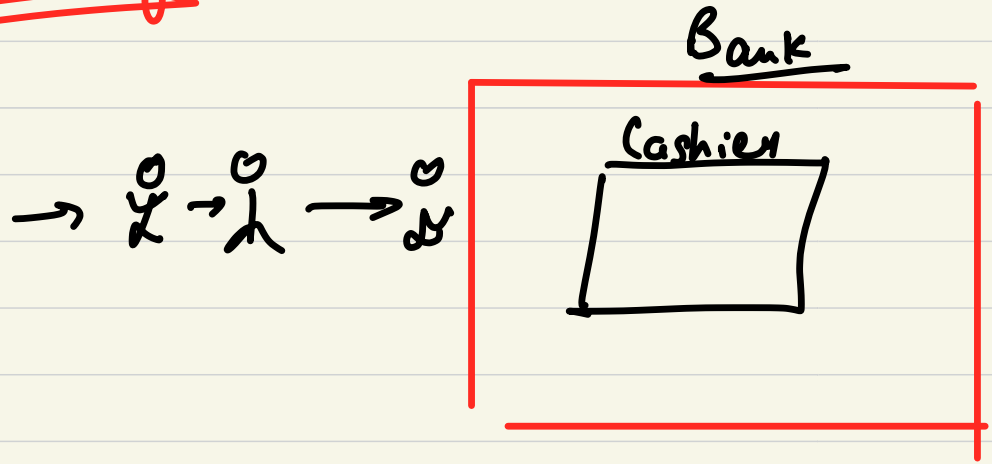
Loops

→ A lot of times we have to do things repeatedly.



using loops we will be able to repeat a task again and again...

Q. Write a program to print the no.'s from 1 to 10.

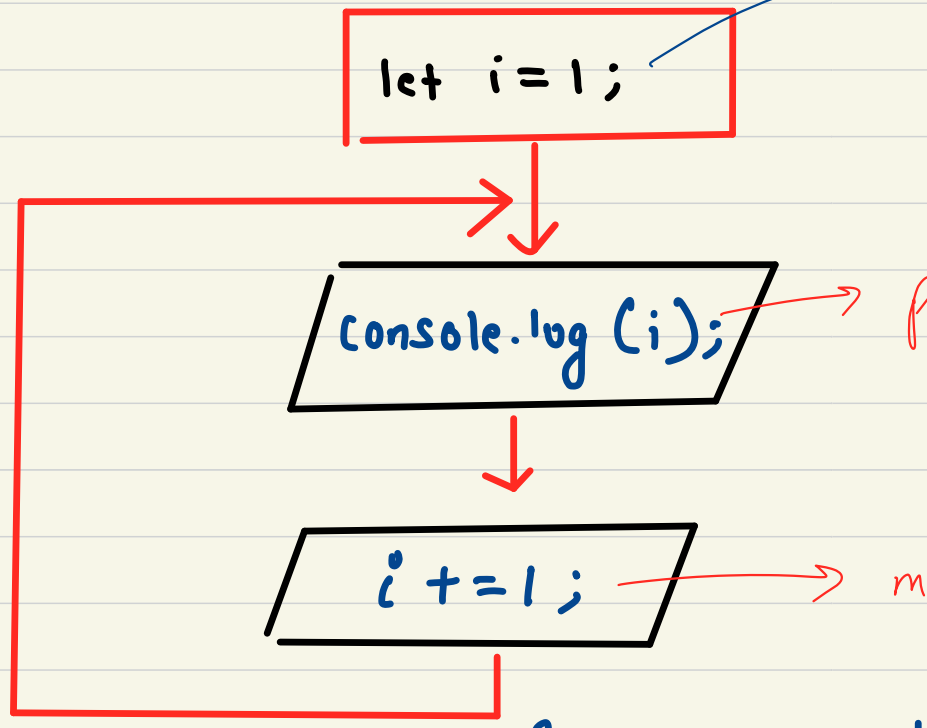
⇒

```
console.log (1);
console.log (2);
console.log (3);
   .
   .
   .
console.log (10);
```

10 times we have to write console.log with diff values.

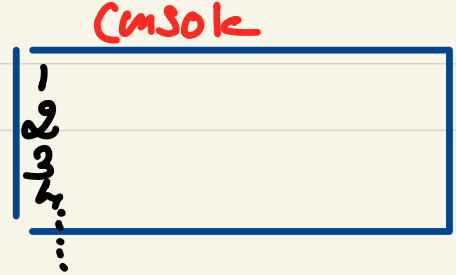
What is the element of repetition?? (printing a number and then moving to the next no.)

1-10



i=1 2 3 4

the above diagram will run infinitely



How to stop this infinite running instruction?

In the prev ques,

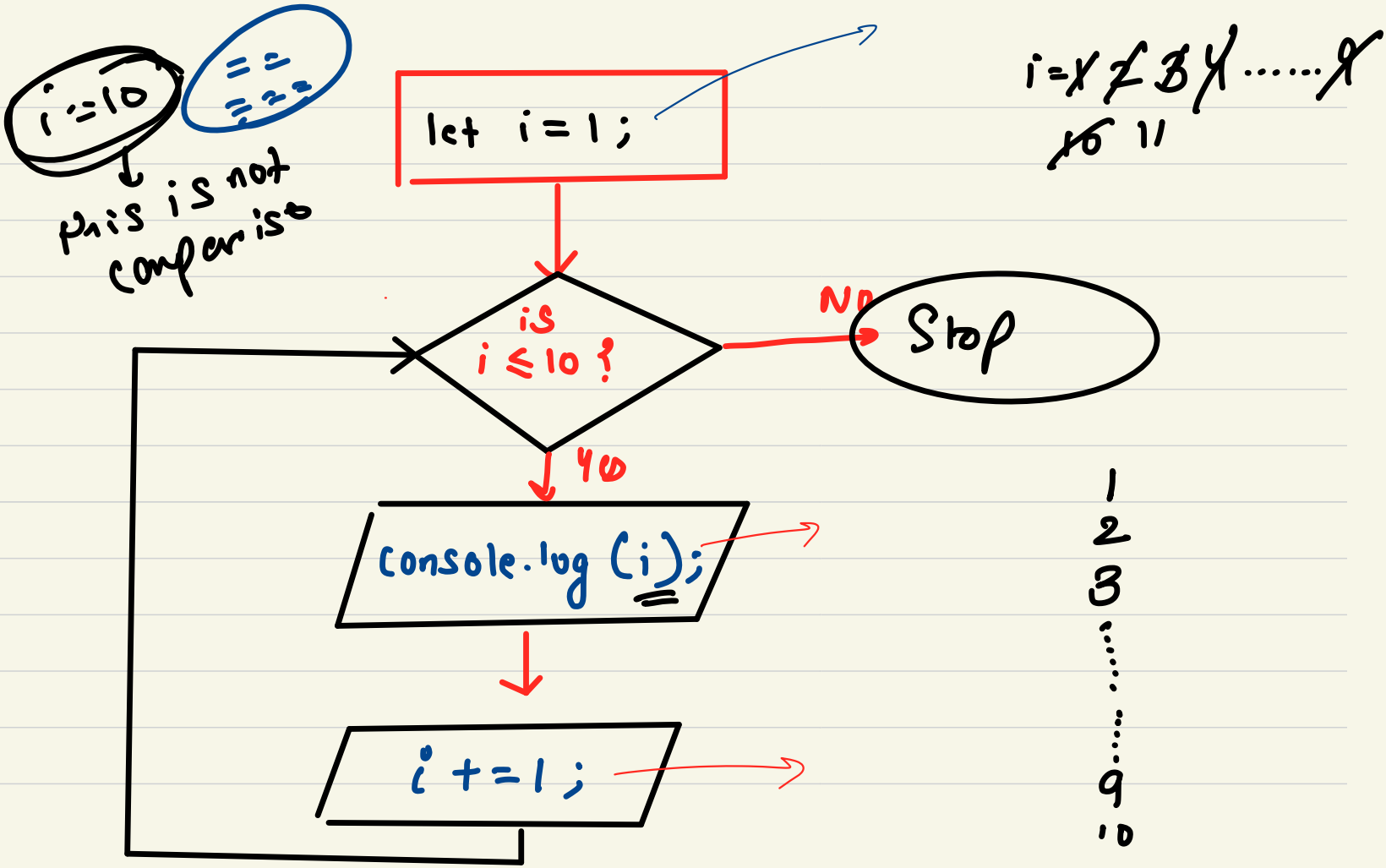
the moment i becomes greater than 10, we want to stop it.

↓

So technically we have to take a decision.

↓

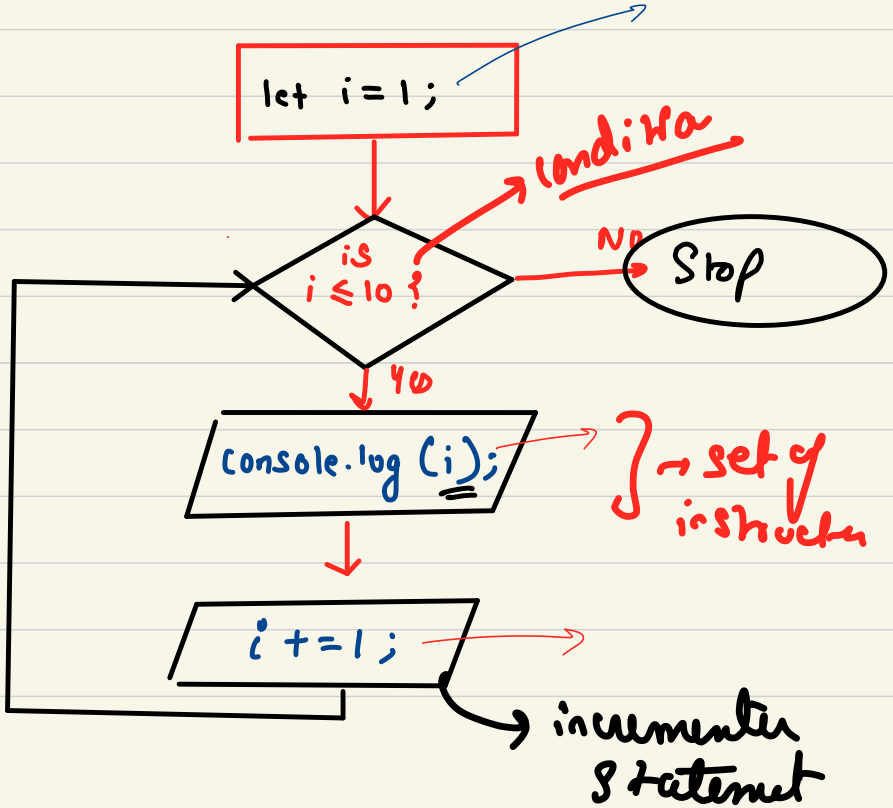
conditionals


i=10
==
===
this is not comparison
let i=1;
is i<=10 ?
NO
Stop
YES
console.log(i);
i+=1;
1
2
3
9
10

How to code a situation like this ??

→ We can define these looping control in multiple ways.

While loop



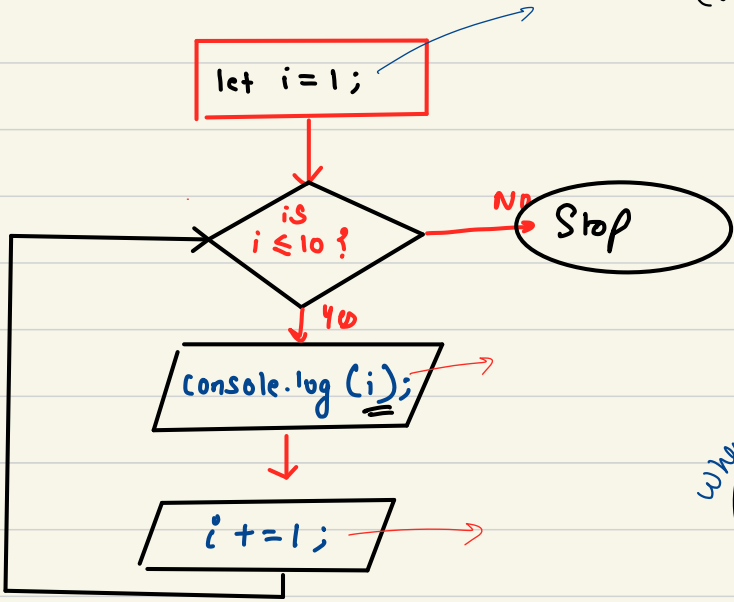
let i = 0;

while (condition) {

Set of instruction

updating statement

}



till the time the condition is true.

```
let i = 1;
while (i <= 10) {
    console.log (i);
    i += 1;
}
console.log ("end")
```

when while loop stops

i = 1 2 3 4 ... ... 9 10 11

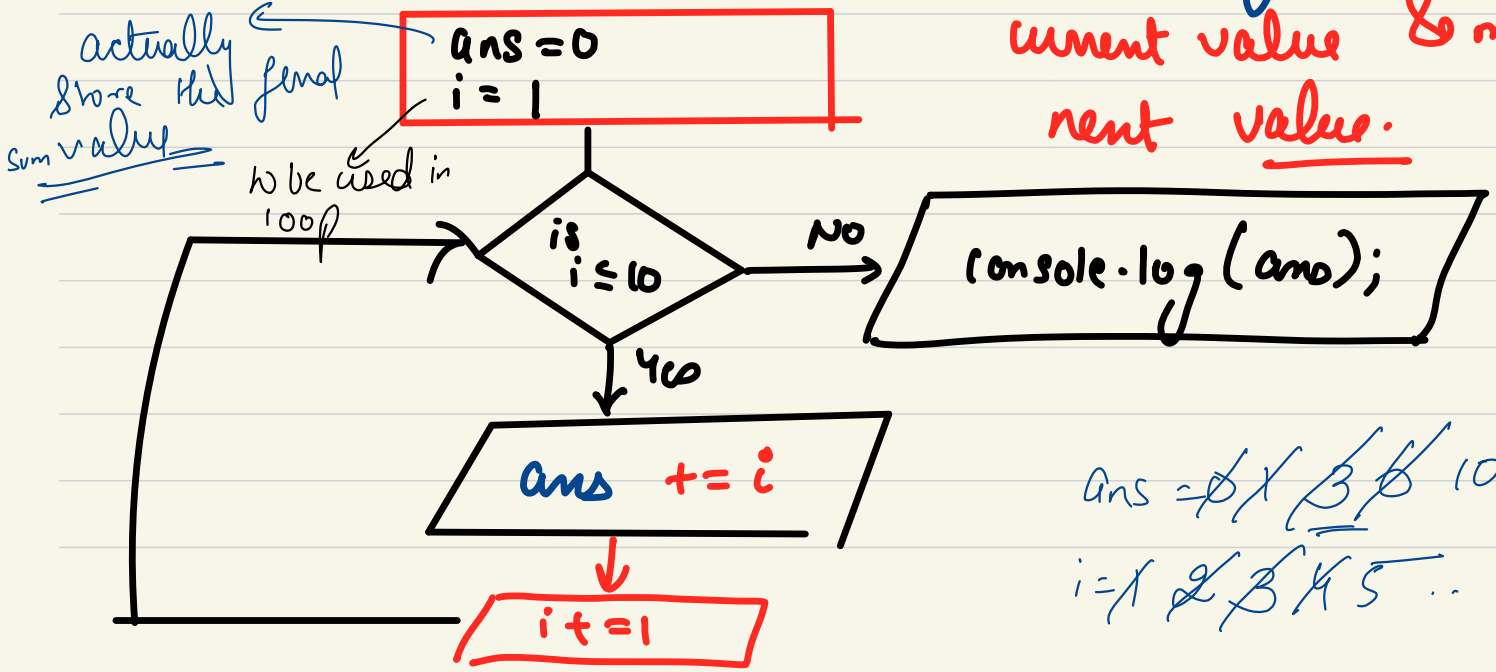
till the time condition remains true, we will again and again execute the whole block.

What is the difference between while and if ??

→ if will only check the condition, doesn't matter if the condition is true or false, it will only check it once.

→ whereas, while loop checks your condition again & again, till the time it becomes false.

Q→ Write a program to calculate Sum of all the no. from 1 – 10.



element of ref → add the current value & move to next value.

ans = 0 1 3 6 10 ...

i = 1 2 3 4 5 ...

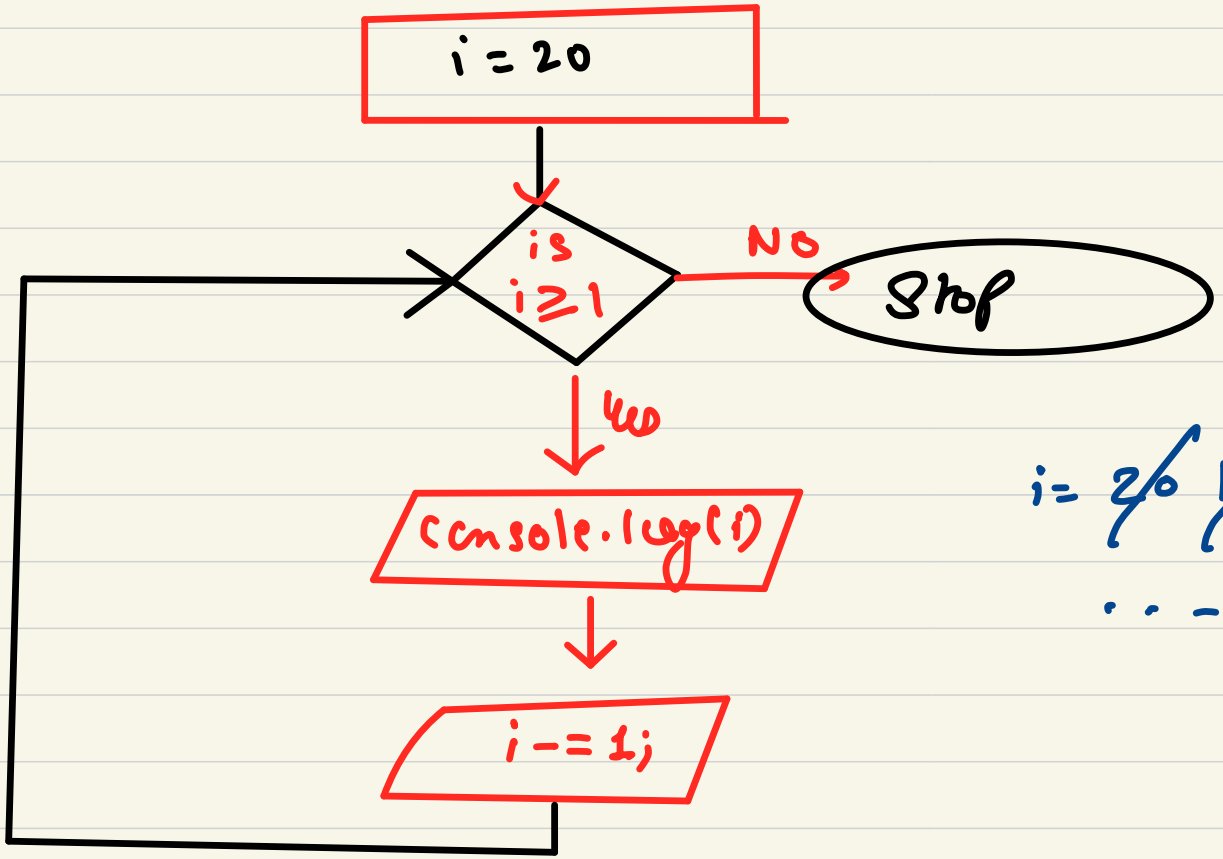
```
let i=1;
let ans=0;

while ( i<=10){
    ans += i;
    i+=1;
}
console.log (ans);
```

Q. Print the numbers from 20 to 1 in decreasing order using while loop.

20
19
18
17
16
.
.
.
.
3
2
1

i=20

20 → 19 → 18 → 17 ------



20
19
⋮
1

i = 20 19 18 .....
.... X 0

for loops

```
let i = 1;
while (i <= 10) {
    console.log(i);
    i += 1;
}
```

```
for (let i = 1; i <= 10; i += 1) {
    console.log(i);
}
```

So for loops are one more way to do same thing as of while loop. There is no particular advantage of using a particular loop.

In for loops the difference with while loops is only of syntax.

variable initialization

```
while( condition) {
    //logic
    updation statement
}
```

⇕

```
for (variable initialization ; condition ;  updation statement ){
    //logic
}
```

Q- Write a program to print all the even numbers greater than 1 and less than 25.

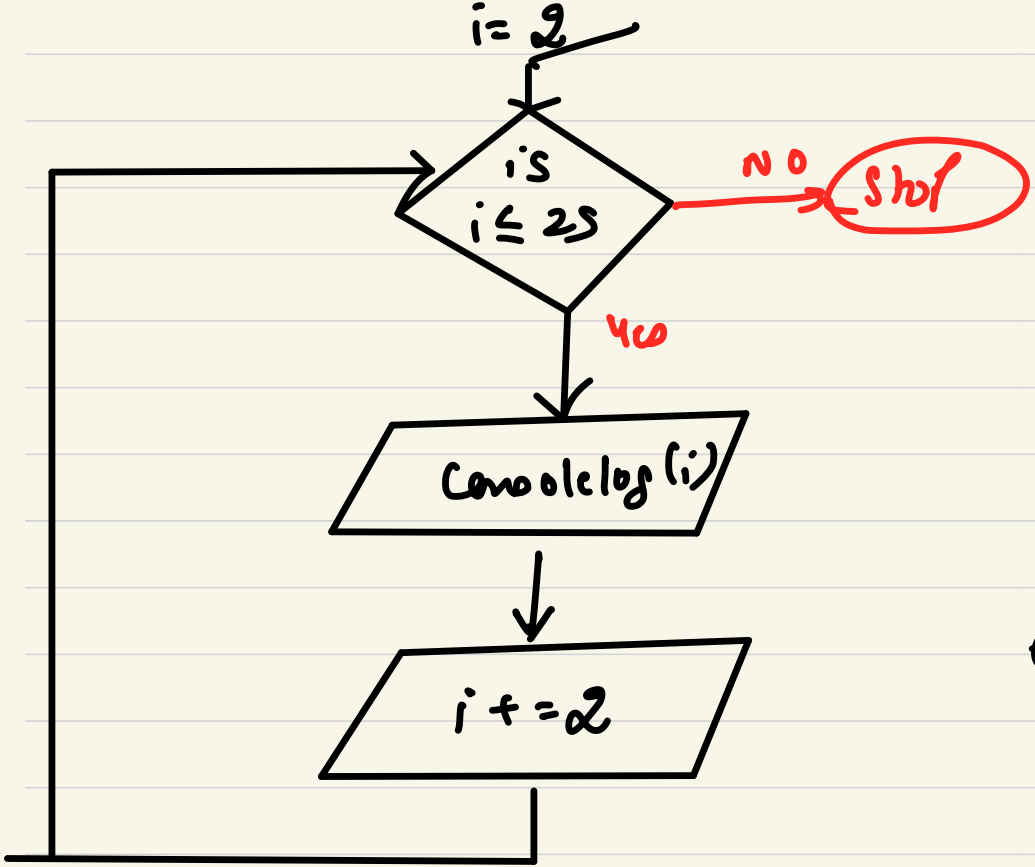
1 → 10

```
for (let i=1 ; i<= 25 ; i++) {
    if (i%2 ==0) {
        console.log(i);
    }
}
```

i = 1 ✗ 3

2
4
6
8
10
12
.
.
.
20
22
24

[1, 25]



i = ~~2~~ ~~4~~ ~~6~~ ...
~~24~~ 26

2
4
6
⋮
24

Q. Write a program to check if a number x is prime or not ?

Eg → x = 7

ans → yes

Eg → x = 14

ans → NO.