Update. ① <u>Extra Class on Sat</u> (2nd April - 9 00 PM)
                ↳ Problem Solving

② Feedback / help
        ↳ Career Guidance Tools.
        ↳ Beta Version , Datapoints
          ↳ 2 friends [Share]

https://t.maze.co/84067855?guerilla=true

③ <u>Update</u> — <u>Assignment</u> ✓

Code Repository

https://github.com/prateek27/java-mar-22

Agenda

↳ While Loop

↳ For Loop   .

→ Maths Based Problems

→ Pattern Problems

→ (Multiple Inputs)   → ++i , i++   Next
                                                    Class
                        → Ternary Op

WarmUp

(Q) Given Two numbers a and n

Print a^n.

$$5^4 = \boxed{5} \times 5 \times 5 \times 5$$

$$= 625$$

$a \xrightarrow{\quad n \text{ times} \quad}$

$$\begin{aligned} ans &- 1 \\ &\to 5 \\ \times 5 \quad &\to 25 \\ \times 5 \quad &\to 125 \\ \times 5 \quad &\to 625 \end{aligned}$$

✓

$a = \cancel{a * a} \; ;$

$a = 5$

25

625

625×625

```
i=1, ans=1
while (i<=n){
    ans = ans * a
    i=i+1
}
print(ans),
```

N times

3

$\sqrt{\boxed{625}}$

i

1

2

3

4

⑤

$5 <= 4$ [Stop]

Ans = 1

$1 \times 5 = 5$

$5 \times 5 = \underline{25}$

$25 \times 5 = 125$

$125 \times 5 = \boxed{625}$

$a = 5$

0
1
2
3
4̸5̸

100
101
102
103
1̸0̸4̸

FOR LOOP (Concise syntax)

↳ another way of writing a loop

① i=1; → init
while (i<= 10) {   ← Stop condition

[work] ♪ ⇐

i=i+1; //update

}

                    init   stop   update
for (i=1, i<= 10, i=i+1) {

[work] ♪ ⇐

}

FOR ⇔ while   (equivalent)

☑ while (<u>hungry</u> && <u>money</u> > <u>500</u>) {

↑ Flow - Same
  Simibu   3   → order Food

☑ for (—; hungry && money > 500   ,   ){

                    3

Q Given a Number N, print the divisors of the number

15 → 1, 3, 5, 15

12 → 1, 2, 3, 4, 6, 12

Loop ↳ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

$N \% i == 0$
↳ yes print(i)

Prime

exactly 2 divs.

No divisors

2-70

11 → (1, 11) ②   Prime

7 → (1, 7) ②   Prime

12 → 1, [2, 3, 4, 6] 12   Not Prime

   2   to   N-1

6 → 1, 2, 3, 6

P

| 1 | P |

exactly 2 divisors
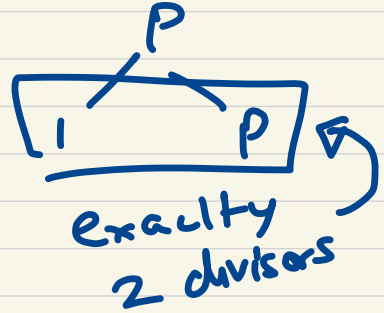
Scope

✓ int i;

for (i=1; i<=5; i++) {

③ Ⓓⓞ

print (i)

→ Restricted for use only
inside the
for loop
(BLOCK Scope)
{ }

for(int i=1; i<=5; i++) (

Ⓓⓞ

③

print (i); ⟶ ERROR

```
if ( ) {

        int money = 10,

    }
        print (money);
              error

for (int i {

        i = 10;

    3
        print (i)
             error
```
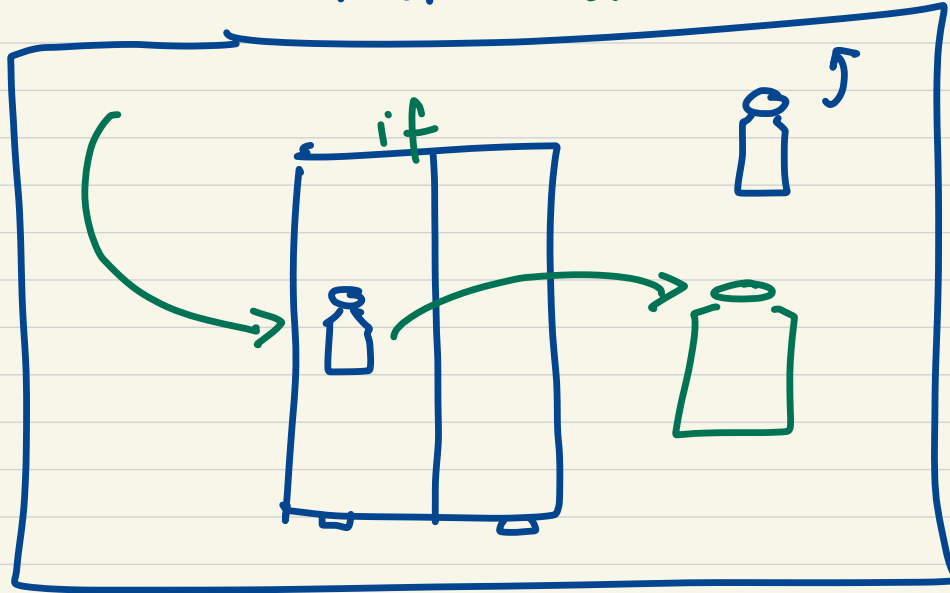
Scope → defines the region in which the
variable can be used

{ }

Room — main

if

Scope

- "Greatest" Common Divisor of 2 Numbers.
  $\hookrightarrow$ Largest no which divides both

A = (20) =7   [1] ——————— [12]

B = (12) ⇒   Think -

14 ↗

	A=20	B =12	gcd

14 13

gcd (a,b)

$\leq \min(a,b)$

$gcd = (\overset{A}{8}, \overset{B}{24}) = (8)$

i=1		A=20	B =12	gcd
	(1)	2̶0̶ ✓	✓	1
	(2)	✓	✓	2
	3	✗	✓	—
	4	✓	✓	4
	5	✗	✗	4
	(			

10

1

$\boxed{10 \cdot 36}$

6

$\big\langle$ 7

$\big\langle$ 8

$\big\langle$ 9

$\big\langle$ 10

$\big\langle$ 11

$\big\langle$ 12

4

4

4

— — $\boxed{4}$

lo 30

Pattern
Problems

$gcd = 1$

12, 20   Top

12   x   x
⤷ 11   x   ʌ
⤷ 10   x   x
⤷ 9   x   x
⤷ 8   x   x

              ⑦   7 , 13
              6
              5

$\{_{\supset}7$

$\subset_{\supset}6$

$\subset_{\supset}5$

$\subset$ | 4 ✓ ✓ |

4
3
2
1
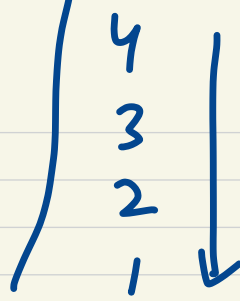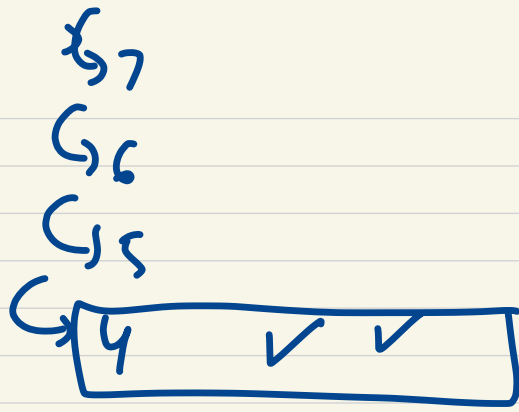
$12 = \boxed{2 \times 2} \times 3$

$20 = \boxed{2 \times 2} \times 5$ ④

if (_) { else (_)

3

- **Mutiple Inputs**

Write a program to input an integer T and then T lines each containing two integers A & B from user and print T lines conatining HCF of two given 2 numbers A and B.

Input

T = 5

	A	B	Output
✓	8	12	4
✓	6	3	3
✓	10	24	2
✓	10	20	10
✓	5	8	1

T Times

Functions

public int Solve (int A) {   ← Input

Functions ↙

↳ functions
(Monday's)

? •

→ printf(Ans),   " return ans; ←
                                  output

3

→ [Vowel] →

→ (Sum of Evens)

while (t --)   bool
           ↑
        Java &
        C++ ✓
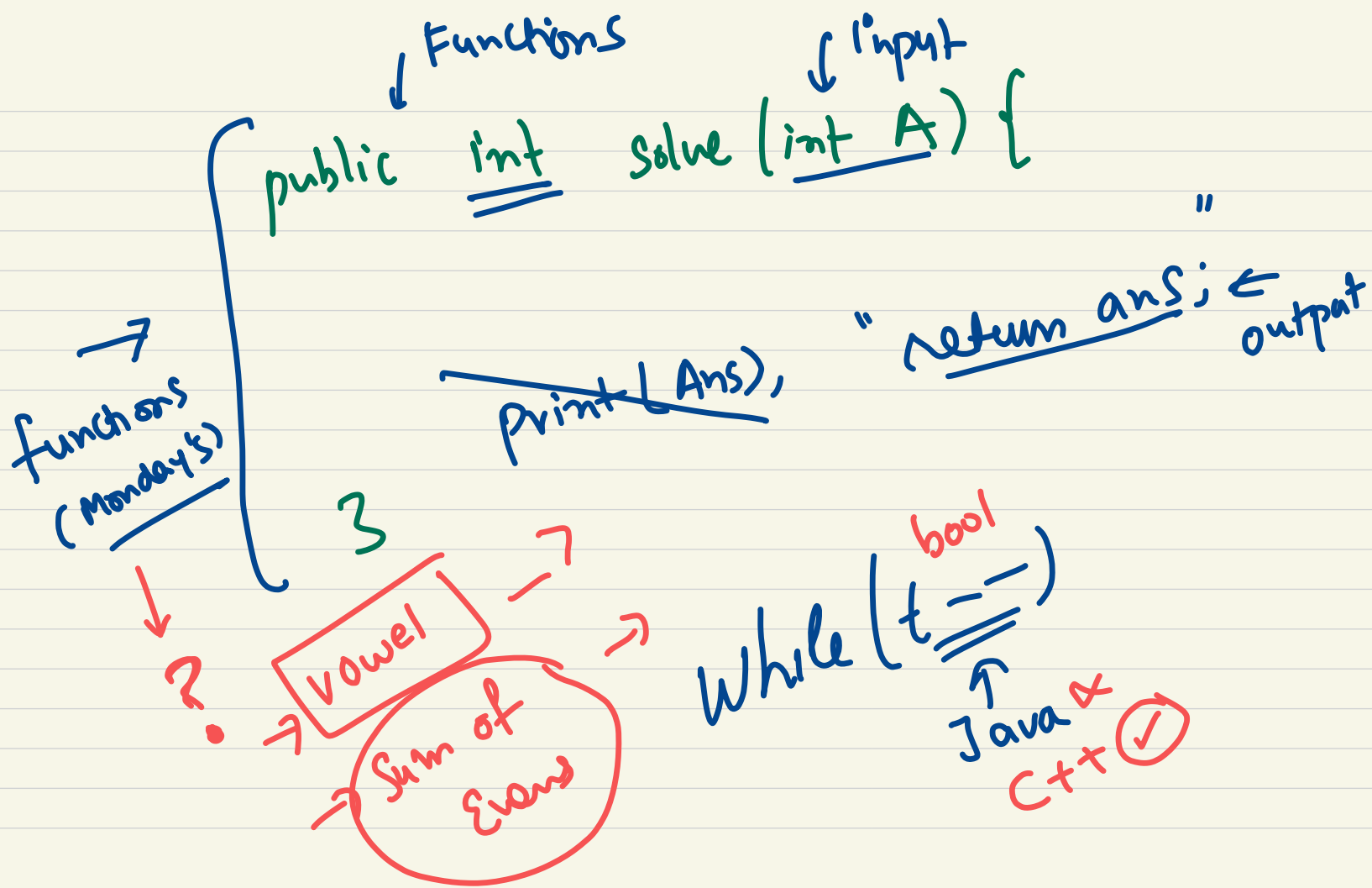
```
Class      XYZ {
    void main() {

                            3

            3
```

Patteun → Logic Building❗

(a) Square

Output   Row by Row

N=3
Input

```
      i=1   * * *
            1 2 3
      i=2   * * *
            1 2 3
      i=3   * * *
            1 2 3
```

Obs.

①   N Rows ⟲ Repeat

②   N Stars in Each Row ⟲ Repeat

$N=4$

$I=1$ | ✳ | 1 Star
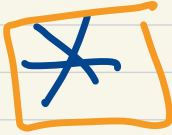
$i=2$ | ✳ ✳ | 2 Star

$i=3$ | ✳ ✳ ✳ | 3 star

$i=4$ | ✳ ✳ ✳ ✳ |
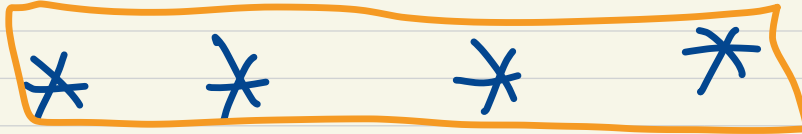
4 Stars.

Obs

1. N Rows

2. In i^{th} Row,
   i No of Stars.

   Inner Loop
   should run
   i times

Q)

(1) → 1
(2)   1 2
(3)   1 2 3
(4)   1 2 3 4
(5)   1 2 3 4 5

Q) Print 'i' Row No

```
1
22
333
4444
55555
```

print ("* _"),   Extra Space

[* _ * _ * _   WA

  * _ * _ * q

obs   N=4   outside the
                       loops

i=1   1

i=2   2   3

i=3   4   5   6

i=4   7   8   9   10

(1) N Rows
        ↳ in ith Row
              ↳ i No of
                   Numbers

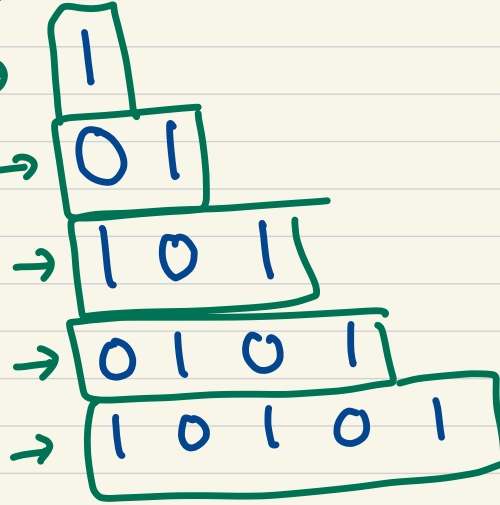   { val of numbers
                  init starts from
                  1 and inc
                  Continuosly

Hw ←

N=5

odd → | 1 |
even → | 0 | 1 |
→ | 1 | 0 | 1 |
→ | 0 | 1 | 0 | 1 |
→ | 1 | 0 | 1 | 0 | 1 |

↓ ↓ ↓

Obs ?

+
−

- - - -
- - - -
- - -
- - -