



Pain of discipline or Pain of regret

Class starts at 8:15pm today

↳ Signup the Hackerrank Contest Pinned
in the chat.

→ Class will end at 10:30 today.

- ↳ Problems
- ↳ for loops
- ↳ break / continue.



Q) Print reverse

Given an integer N , print all digits from Right to left.

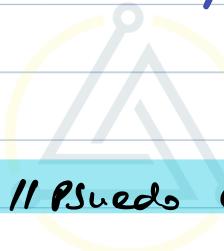
$$\text{ex: } N = 2375$$

↳ 5 7 3 2

//idea!

$$N = 142 \rightarrow \text{int lastdigit} = N \% 10 = 2$$

$$N = 15736 \rightarrow \text{int lastdigit} = N \% 10 = 6$$



// Pseudo Code

P S v main () {

Scanner scn = new Scanner (System.in);

int n = scn.nextInt(); → 1234

if ($n < 0$) { n = n * -1; }

$n \neq 0$

while ($n > 0$) {

int lastdigit = n % 10;

System.out.println (lastdigit);

n = n / 10;

3

$$n = 10$$

System.out.println(n); → 10



$$n = n + 1;$$

System.out.println(n); → 11

"11"

~

~~$$n + 1;$$~~

System.out.println(n); → 11

$$n = n + 1;$$

$$n = 1234$$

P S v main () {

Scanner scn = new Scanner (System.in);
int n = scn.nextInt(); → 1234

$$0$$

n

lastdigit: 1

while (true) {

int lastdigit = n % 10;
System.out.println (lastdigit);
n = n / 10;

3

4
3
2
1

Variables created inside while() loop gets deleted
before next iteration.

$$n = 12004$$



// For loop basics

```
int i=0;  
while (i<10) {  
    // Statement  
    i++;  
}
```

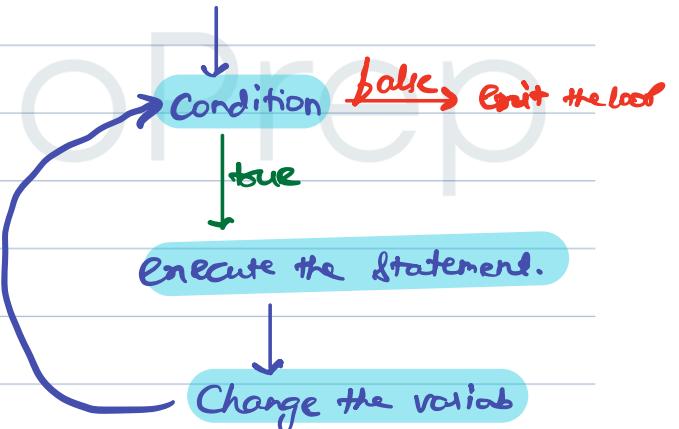


```
for (int i=0; i<10; i++) {  
    // Statement  
}
```

3

flow:
↓

1 time: initialize i



Q) Print numbers from 1 to 5 using for loop.

```
for (int i=1; i<=5; i++) {  
    System.out.println(i);  
}
```



Q) Count factors

Given a Positive number, Point all the factors of that number.

↳ numbers completely dividing n

Ex: 12: 1 2 3 4 6 12
17: 1 17
↳ remainders should be 0]

Quiz: 24: 1 2 3 4 6 8 12 24

minimum factor of n: 1

maximum factor of n: n

↳ figure out factors between 1 to n.

Ideas

$$N = 10$$

$$1 \rightarrow N \% 1 \Rightarrow 10 \% 1 = 0 \quad \checkmark$$

$$2 \rightarrow N \% 2 \Rightarrow 10 \% 2 = 0 \quad \checkmark$$

$$3 \rightarrow N \% 3 \Rightarrow 10 \% 3 = 1 \quad \times \times$$

$$4 \rightarrow N \% 4 \Rightarrow 10 \% 4 = 2 \quad \times \times$$

$$5 \rightarrow N \% 5 \Rightarrow 10 \% 5 = 0 \quad \checkmark$$

$$6 \rightarrow N \% 6 \Rightarrow 10 \% 6 = 4 \quad \times \times$$

$$7 \rightarrow N \% 7 \Rightarrow 10 \% 7 = 3 \quad \times \times$$

$$8 \rightarrow N \% 8 \Rightarrow 10 \% 8 = 2 \quad \times \times$$

$$9 \rightarrow N \% 9 \Rightarrow 10 \% 9 = 1 \quad \times \times$$

$$10 \rightarrow N \% 10 \Rightarrow 10 \% 10 = 0 \quad \checkmark$$



// Pseudo Code

```
for ( int i=1; i<=n; i++ ) {  
    Scanner scn = new Scanner (System.in);  
    int n = scn.nextInt();
```

n iterations ←

```
for ( int i=1; i<=n; i++ ) {  
    if ( n% i == 0 ) {  
        System.out.println (i);  
    }  
}
```



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Tracing

```
for ( int i=1; i<=n; i++ ) {  
    if ( n% i == 0 ) {  
        System.out.println (i);  
    }  
}
```

n=6

i	i<=n	n% i	i++
1	true	0	1 2
2	true	0	2 3
3	true	0	3 4
4	true	2	5
5	true	1	6
6	true	0	6 7

1 iteration → 1 completion of loop

7 false
6 exit from loop

Break till 9:50 PM



(Q) IsPrime?

No divisible by
1 and itself

Given a number N , Print "Prime" if the number is a prime number else "Not Prime".

Ex: $N = 3 \rightarrow \{1, 3\} \rightarrow \text{Prime}$
 $N = 13 \rightarrow \{1, 13\} \rightarrow \text{Prime}$
 $N = 25 \rightarrow \{1, 5, 25\} \rightarrow \text{Not Prime}$

Quiz: $N = 1 \rightarrow \text{Neither Prime nor Composite.}$

Ideas

if factor Count == 2 → Prime
else → not Prime

Pseudo code

```

P ↳ r main () {
    Scanner scn = new Scanner (System.in);
    int n = scn.nextInt();
    int count = 0;
    for (int i = 1; i <= n; i++) {
        if (n % i == 0) {
            count = count + 1;
        }
    }
    if (count == 2) {
        System.out.println ("Prime");
    } else {
        System.out.println ("Not Prime");
    }
}

```



$N=5$

```
P & r main () {  
    Scanner scn = new Scanner (System.in);  
    int n = scn.nextInt();  
    int Count = 0;  
    for (int i = 1; i <= n; i++) {  
        if (n % i == 0) {  
            Count = Count + 1;  
        }  
    }  
    if (Count == 2) { System.out.println ("Prime");}  
    else { System.out.println ("Not Prime");}  
}
```

i	i <= n	$n \% i == 0$	Count	Print
1	+	true	1	2
2	+	false	1	3
3	+	false	1	4
4	+	false	1	5
5	+	true	2	6
6		false		break from loop



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//break Statement

```
for(int i=1; i<4; i++) {  
    System.out.println(i);  
}
```

- 1
- 2
- 3

→ break → the moment you execute break Statement
you exit the Current loop.

Ex :-

```
for(int i=1; i<10; i++) {  
    System.out.println(i);  
    if (i==2) { break; }  
}
```

- 1
- 2

i	i < 10	i == 2
1	true	false
2	true	true



Quiz 3:

```
for(int i=0; i<5; i++) {  
    if (i>2) {break;}  
    System.out.print(i + " ");
```

3

i	i < 5	if
0	+	b
1	+	b
2	+	b
3	+	t

0 1 2

Quiz 4:

```
for (int i=0; i<5; i++) {  
    break;  
    System.out.println(i);
```

3

i	i < 5
0	+

-> terminate



// Continue Statement → Skip & go to next iteration.

```
for (int i=0; i<=5 ; i++) {  
    if (i==2) {  
        Continue;  
    }  
    System.out.println(i);  
}
```

i	i <= 5	i = 2
0	+	↓
1	+	↓
2	+	↑
3	+	↓
4	+	↓
5	+	↓
6	→ exit	↓



0 1 3 4 5

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Quiz 5:

```
for (int i=0; i<=5 ; i++) {
    if (i==2 || i==3) {
        continue;
    }
    System.out.print(i+"");
}
```

3

0 1 4 5

i	$i <= 5$	if
0	t	b
1	t	b
2	t	t
3	t	b
4	t	b
5	t	b
6		b

6 ↳ exit

Quiz 6:

```
for (int i=0; i<=5 ; i++) {
    if (i==2 && i==3) {
        continue;
    }
    System.out.print(i+"");
}
```

3

0 1 2 3 4 5

i	$i <= 5$	if
0	t	b
1	t	b
2	t	b
3	t	b
4	t	b
5	t	b
6	b	b

6 ↳ exit



Q) Paint n "*" in a single row.



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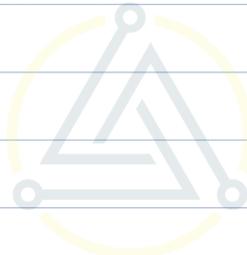
Q) Given integer n , print square of $n \times n$ using
"*"!

$n=3$

**
* * *

$n=5$

**
* * *



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a) Pattern 1:

↳ Point the following pattern.

$N=2$:

* *

$N=4$:

* *

* * *

* * * *



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Q) Pattern 2:

↳ Point the following Pattern.

$N=3 :$ 1

 2 3

 4 5 6

$N=4 :$ 1

 2 3

 4 5 6

 7 8 9 10



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