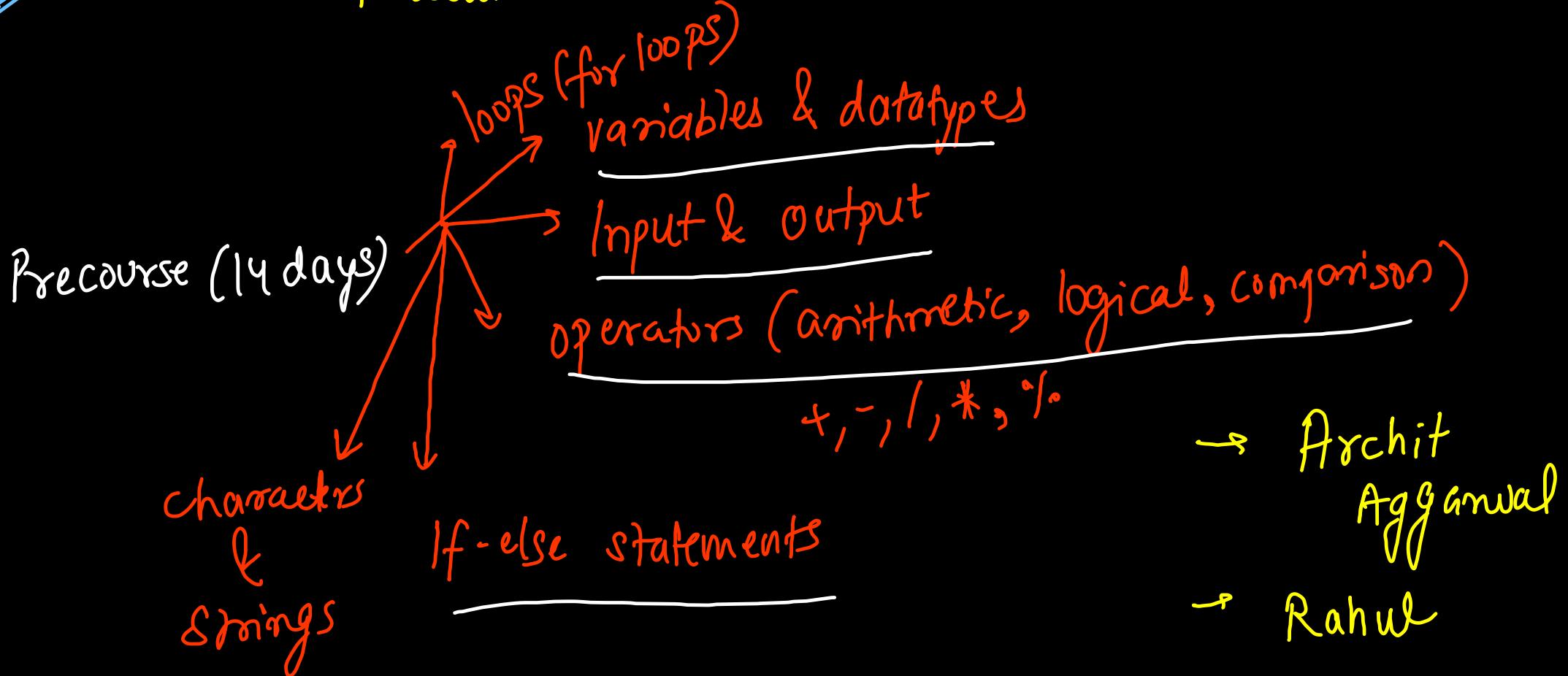


Day 1

FS - 71
Java Basics
Module - 1



Archit Aggarwal

SDE @ Salesforce

Senior @ DTU (CS' Btech)

2000+ Problems on Leetcode, QFG, Hackerrank, Pepcoding

1.5 yrs (10-11 months)

Shop Discount

A shop will give a discount of 10% on the total cost if the cost of the quantity purchased is more than 1000. a. Ask user for the number of units b. Suppose, one unit will cost 100. c. Judge and print total cost for the user in the integer format.

Cost $> 1000 \Rightarrow$ 10% discount

Cost $\leq 1000 \Rightarrow$ 0% discount

price per unit = 100^{rs}

totalcost = units * price

```
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);

        int units = scn.nextInt();
        int totalCost = units * 100;

        if(totalCost > 1000){
            totalCost = totalCost * 90 / 100;
        }

        System.out.println(totalCost);
    }
}
```

$$\text{units} = 5$$

$$\text{totalCost} = 5 \times 100 = 500$$

$$500 > 1000$$

false

$$\text{units} = 20$$

$$\text{totalCost} = 20 \times 100 = 2000$$
$$= 1800$$

$$2000 > 1000$$

true

Print Bonus

The bonus in a company is given by $\text{Bonus} = \text{Salary} * (5 / 100)$. A company decided to give a bonus of 5% to employees if his/her years of service is more than 5 years. Ask user for their salary and year of service and print the net bonus amount. If the years of service is less than or equal to 5, print 0, otherwise print Bonus calculated.

years of service > 5

$$\text{bonus} = \text{Salary} \times 5/100$$

20000

6 > 5

$$\text{bonus} = \frac{20000 \times 5}{100}$$
$$= 1000$$

≤ 5

$$\text{bonus} = 0$$

or
10000

$5 \leq 5$

$$\text{bonus} = 0$$

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
  
    int salary = scn.nextInt();  
    int years = scn.nextInt();  
  
    if(years > 5){  
        int bonus = salary * 5 / 100;  
        System.out.println(bonus);  
    } else {  
        System.out.println("0");  
    }  
}
```

Attendance
minute by minute

$$\begin{aligned} \text{Salary} &= 25 \\ &= 25 + 5 / 100 \\ &= 25 / 100 \\ &= \cancel{1.25} \end{aligned}$$

Print oldest among three

eg1

$$A = 10, \quad B = 20, \quad C = 30 \Rightarrow "C"$$

eg2

$$A = 20, \quad B = 30, \quad C = 10 \Rightarrow "B"$$

eg3

$$A = 30, \quad B = 5, \quad C = 15 \Rightarrow "A"$$

If-else-if ladder

```
if( a>b && a>c )  
{   System.out.println("A"); }  
else if ( b>c )  
{   System.out.println("B"); }  
else  
{   System.out.println("C"); }
```

Given
 $A = 30, B = 5, C = 15$

$A > B$ If $A > C$
true If $30 > 15$
 true
 = true
 "A"

~~eg1~~ $A = 10, B = 20, C = 30$

① $10 > 20 \& \& ?$
False $\& \& ?$
= false

~~eg2~~ $A = 20, B = 30, C = 10$

① $A > B \& \& A > C$
 $20 > 30 \& \& ?$
false $\& \& ?$ = false

② $20 > 30$
= false

② $B > C$
 $30 > 10 \Rightarrow \text{true}$
" \Downarrow "

③ ~~C~~

ladder

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
  
    int a = scn.nextInt();  
    int b = scn.nextInt();  
    int c = scn.nextInt();  
  
    if(a > b && a > c)  
    {  
        System.out.println("A");  
    }  
    else if(b > c)  
    {  
        System.out.println("B");  
    }  
    else  
    {  
        System.out.println("C");  
    }  
}
```

nested if else

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int a = scn.nextInt();  
    int b = scn.nextInt();  
    int c = scn.nextInt();  
  
    if(a > b)  
    {  
        if(a > c)  
            System.out.println("A");  
        else  
            System.out.println("C");  
    }  
    else  
    {  
        if(b > c)  
            System.out.println("B");  
        else  
            System.out.println("C");  
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int a = scn.nextInt();  
    int b = scn.nextInt();  
    int c = scn.nextInt();  
  
    1 if(a > b)  
    {  
        2 if(a > c)  
            System.out.println("A");  
        3 else  
            System.out.println("C");  
    }  
    6 else  
    {  
        7 if(b > c)  
        8     System.out.println("B");  
        9 else  
        10    System.out.println("C");  
    }  
}
```

Ques A = ~~20~~, B = ~~30~~, C = ~~15~~

1. $20 > 30$

false

2. $b > c$
 $30 > 15$

true

8. "B"

eg(

$$A \cancel{=} 10, \quad B \cancel{=} 20,$$

$$C = 30$$

$$\text{eg} \quad A = 20, \quad B \cancel{=} 5, \quad C \cancel{=} 10$$

1. $A > B$

$$10 > 20$$

false

$$10$$

$$A > B$$

$$20 > 5$$

true

2. $B > C$

$$20 > 30$$

false

2. $A > C$

$$20 > 10$$

true

3. "C"

3. "A"

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int a = scn.nextInt();  
    int b = scn.nextInt();  
    int c = scn.nextInt();  
  
    String res = (a > b) ? ((a > c) ? "A" : "C") : ((b > c) ? "B" : "C");  
    System.out.println(res);  
}
```

using ternary
operator
(not intuitive)

hint final z

x

y

z

Take input three numbers x, y, z as an integer input

Then if the value of x is greater than or equal to 20,

- a. If the value of y is greater than or equal to 100 then add 100 to the value of z.
- b. If the value of y is less than 100 and greater than or equal to 50, then add 50 to the value of z.
- c. Else add 10 to the value of z.

Else if the value of x is less than 20,

- a. If the value of y is greater than or equal to 100 then add 3 to the value of z.
- b. If the value of y is less than 100 and greater than or equal to 50, then add 2 to the value of z.
- c. Else add 1 to the value of z.

Print the final value of z as an integer output in the end.

```

if(x > 20)
{
    if(y > 100) z = z + 100;
    else if(y > 50) z = z + 50;
    else z = z + 10;
}
else {
    if(y > 100) z = z + 3;
    else if(y > 50) z = z + 2;
    else z = z + 1;
}
System.out.println(z);

```

~~x~~
~~y~~
~~z~~
~~yellow~~
~~green~~
~~30 > 20~~
~~120 > 100~~
~~100 + 30 = 130~~

~~x~~
~~y~~
~~z~~
~~yellow~~
~~green~~
~~22 > 20~~
~~55 > 50~~
~~40~~

~~yellow~~
~~green~~
~~22 > 20~~
~~y > 100 \Rightarrow 55 $\not>$ 100~~
~~y > 50 \Rightarrow 55 $>$ 50~~
~~40 + 50 = 90~~

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);

    int x = scn.nextInt();
    int y = scn.nextInt();
    int z = scn.nextInt();

    if(x >= 20)
    {
        if(y >= 100) System.out.println(z + 100);
        else if(y >= 50) System.out.println(z + 50);
        else System.out.println(z + 10);
    }
    else
    {
        if(y >= 100) System.out.println(z + 3);
        else if(y >= 50) System.out.println(z + 2);
        else System.out.println(z + 1);
    }
}
```

Tell about x y

Take in two inputs x and y from the user, and then

- If the value of x is greater than or equal to 59 and y is greater than or equal to 10, then print "X is greater than or equal to 59 and y is greater than or equal to 10"
- If the value of x is greater than or equal to 50, and y is less than 10, then print "X is greater than or equal to 50 and y is less than 10"
- Else print "None of the condition matches"

```
if ( x >= 59 && y >= 10 )
```

```
    System.out.println();
```

```
else if ( x >= 50 && y < 10 )
```

```
    System.out.println();
```

```
else    System.out.println("None");
```

eg
x = 0 y = 100

x >= 59

0 >= 59

false and ?

= false

x >= 50 & 0 >= 10 & ? = f

if $x = 70$, $y = 15$

$70 > 59$ and $15 > 10$

true and true

= true

①

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
  
    int x = scn.nextInt();  
    int y = scn.nextInt();  
  
    if(x >= 59 && y >= 10)  
        System.out.println("X is greater than or equal to 59 and y is greater than or equal to 10");  
    else if(x >= 50 && y < 10)  
        System.out.println("X is greater than or equal to 50 and y is less than 10");  
    else System.out.println("None of the condition matches");  
}
```

Print Incremented Salary

Take in three inputs age, salary, experience, then

- a. If age is greater than 60 and salary is greater than 20,000 and experience is greater than 20 years, then add 5000 to the salary.
- b. If age is greater than 40 and salary is greater than 15,000 and experience is greater than 10 years, then add 2000 to the salary.
- c. If age is greater than 30 and salary is greater than 10,000 and experience is greater than 5 years, then add 1000 to the salary.
- d. Otherwise add 500 to the salary.

In the end Print the final salary.

$age > 60$ and $salary > 20000$ and $experience > 20$

$Salary + 5000$

$age > 40$ and $salary > 15000$ and $experience > 10$

$Salary + 2000$

\Rightarrow atmost 60 $\rightarrow \leq 60$

\Rightarrow atleast 60 $\rightarrow \geq 60$

\Rightarrow (strictly) more ^(above 60) than 60 $\rightarrow > 60$

\Rightarrow (strictly) less than 60 $\rightarrow < 60$
(below 60)

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
  
    int age = scn.nextInt();  
    int salary = scn.nextInt();  
    int experience = scn.nextInt();  
  
    if(age > 60 && salary > 20000 && experience > 20)  
        System.out.println(salary + 5000);  
    else if(age > 40 && salary > 15000 && experience > 10)  
        System.out.println(salary + 2000);  
    else if(age > 30 && salary > 10000 && experience > 5)  
        System.out.println(salary + 1000);  
    else System.out.println(salary + 500);  
}
```

age = 35

Salary = 10000

experience = 9

Salary + 500

10000 + 500

10500

Print final z given xyz

Homework

Problem

Submissions

Leaderboard

Discussions

Take in x, y, z as integer inputs from the user,

- a. If x is greater than or equal to 20 and z is less than 100 then add 200 to the value of z.
- b. If x is greater than or equal to 10, or y is less than 50 Then add 100 to the value of z.

In the end print the final value of z as an integer output.

Characters

Primitive datatypes

- | | |
|-----------|---------|
| → int | → float |
| → boolean | → long |
| → char | → short |
| → double | → byte |

⑧

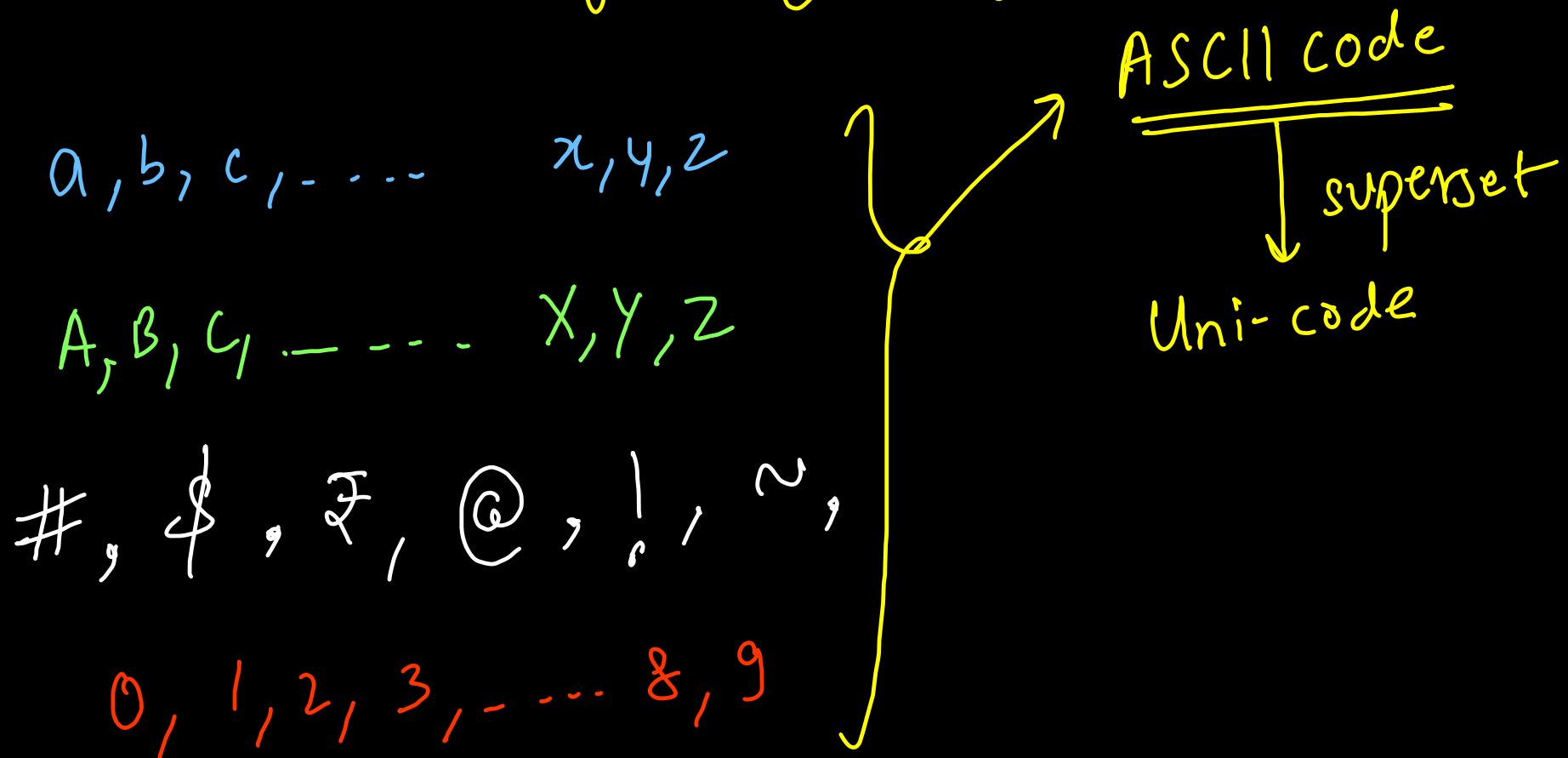
Derived Datatypes
String

"archit"
↓ { } ↘
'a', 'Y', 'c', 'h', 'i', 't'

Arrays

{ 95, 83, 62, ... }

Programming languages



Dec	Char	Dec	Char	Dec	Char	Dec	Char
0	NUL (null)	32	SPACE	64	@	96	`
1	SOH (start of heading)	33	!	65	A	97	a
2	STX (start of text)	34	"	66	B	98	b
3	ETX (end of text)	35	#	67	C	99	c
4	EOT (end of transmission)	36	\$	68	D	100	d
5	ENQ (enquiry)	37	%	69	E	101	e
6	ACK (acknowledge)	38	&	70	F	102	f
7	BEL (bell)	39	'	71	G	103	g
8	BS (backspace)	40	(72	H	104	h
9	TAB (horizontal tab)	41)	73	I	105	i
10	LF (NL line feed, new line)	42	*	74	J	106	j
11	VT (vertical tab)	43	+	75	K	107	k
12	FF (NP form feed, new page)	44	,	76	L	108	l
13	CR (carriage return)	45	-	77	M	109	m
14	SO (shift out)	46	.	78	N	110	n
15	SI (shift in)	47	/	79	O	111	o
16	DLE (data link escape)	48	0	80	P	112	p
17	DC1 (device control 1)	49	1	81	Q	113	q
18	DC2 (device control 2)	50	2	82	R	114	r
19	DC3 (device control 3)	51	3	83	S	115	s
20	DC4 (device control 4)	52	4	84	T	116	t
21	NAK (negative acknowledge)	53	5	85	U	117	u
22	SYN (synchronous idle)	54	6	86	V	118	v
23	ETB (end of trans. block)	55	7	87	W	119	w
24	CAN (cancel)	56	8	88	X	120	x
25	EM (end of medium)	57	9	89	Y	121	y
26	SUB (substitute)	58	:	90	Z	122	z
27	ESC (escape)	59	;	91	[123	{
28	FS (file separator)	60	<	92	\	124	
29	GS (group separator)	61	=	93]	125	}
30	RS (record separator)	62	>	94	^	126	~
31	US (unit separator)	63	?	95	_	127	DEL

character integer

$$'0' \neq 0$$

$$'0' = 48$$

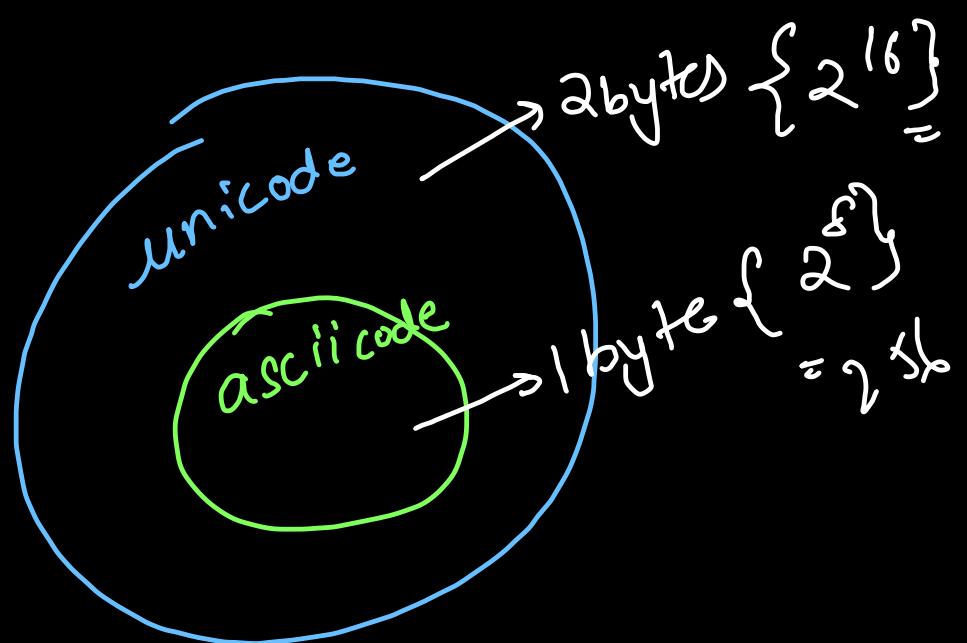
$$'A' - 'Z'$$

$$65 - 90$$

$$'a' - 'z'$$

$$97 - 122$$

```
public static void main(String[] args) {  
    int var1 = 'A'; // 65  
    System.out.println(var1);  
  
    int var2 = '0'; // 48  
    System.out.println(var2);  
  
    int var3 = 'z'; // 122  
    System.out.println(var3);  
  
    int var4 = 'A' - 'a'; // 65 - 97 = -32  
    System.out.println(var4);  
  
    int var5 = '9' - '0'; // 57 - 48 = 9  
    System.out.println(var5);  
  
    int var6 = '5' - 3; // 53 - 3 = 50  
    System.out.println(var6);  
  
    int var7 = 'a' + 'b'; // 97 + 98 = 195  
    System.out.println(var7);  
}
```



Take in a character as an input and then

a. Print "Small case" if it is a small case character.

$$'a' - 'z' \Rightarrow 97 - 122$$

b. Print "Capital case" if it is a capital case character.

$$'A' - 'Z' \Rightarrow 65 - 90$$

c. Print "Digit" if it is a digit.

$$'0' - '9' \Rightarrow 48 - 57$$

d. Print "None" is none of the above conditions follow.

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    char ch = scn.next().charAt(0);  
  
    if(ch >= 'a' && ch <= 'z') {  
        System.out.println("Small case");  
    }  
    else if(ch >= 'A' && ch <= 'Z') {  
        System.out.println("Capital case");  
    }  
    else if(ch >= '0' && ch <= '9') {  
        System.out.println("Digit");  
    }  
    else {  
        System.out.println("None");  
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    char ch = scn.next().charAt(0);  
  
    if(ch >= 97 && ch <= 122){  
        System.out.println("Small case");  
    }  
    else if(ch >= 65 && ch <= 90){  
        System.out.println("Capital case");  
    }  
    else if(ch >= 48 && ch <= 57){  
        System.out.println("Digit");  
    }  
    else {  
        System.out.println("None");  
    }  
}
```

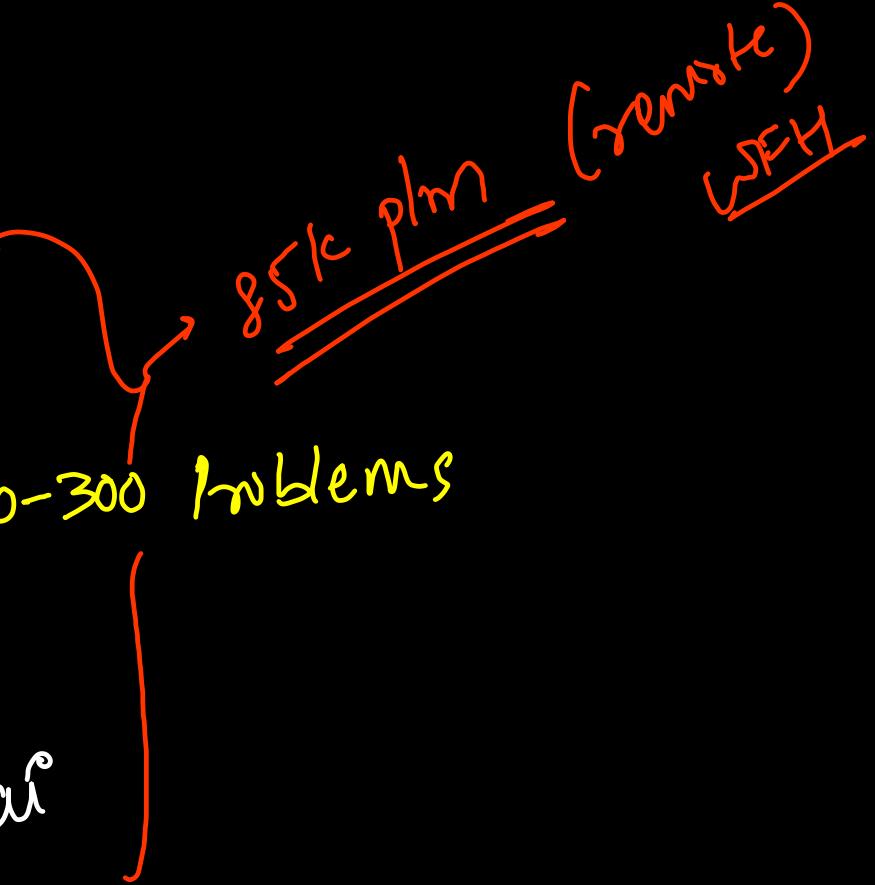
Hindi medium

+

Average Coding → 250-300 problems

+

6th street → dubai



```

public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);

    char ch = scn.next().charAt(0);

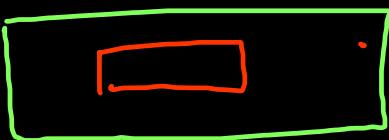
    if(ch >= 'a' && ch <= 'z'){
        // Lowercase to Uppercase : -32
        char ans = (char)(ch - 32);
        System.out.println(ans);
    } else {
        // Uppercase to Lowercase : +32
        char ans = (char)(ch + 32);
        System.out.println(ans);
    }
}

```

(implicitly)
no need of typecasting

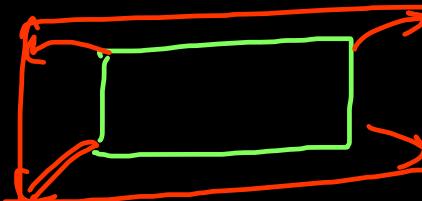
char ↑ → int
2 bytes 4 bytes

int var1 = 'A';



explicit typecasting
int → char
4 bytes 2 bytes

char var2 = (char) 65;



Concatenation

$$\text{"archit"} + \text{10} \Rightarrow \text{archit10}$$

$$\text{"a"} + \text{10} \Rightarrow \text{a10}$$

integer
addition
(ASCII)

$$\left\{ \begin{array}{l} \text{'a'} + \text{10} \Rightarrow \text{107} \\ \text{'g'} + \text{10} \\ \text{'5'} + \text{3} \Rightarrow \text{56} \\ \text{'3'} + \text{3} \end{array} \right.$$