

C++, OOPs & CP - Practice Session I

Special class

-

STL

Sundays

8 - 11 March

4:30 PM High Prob., Puzzles

Jay Bansal • Mar 8, 2021

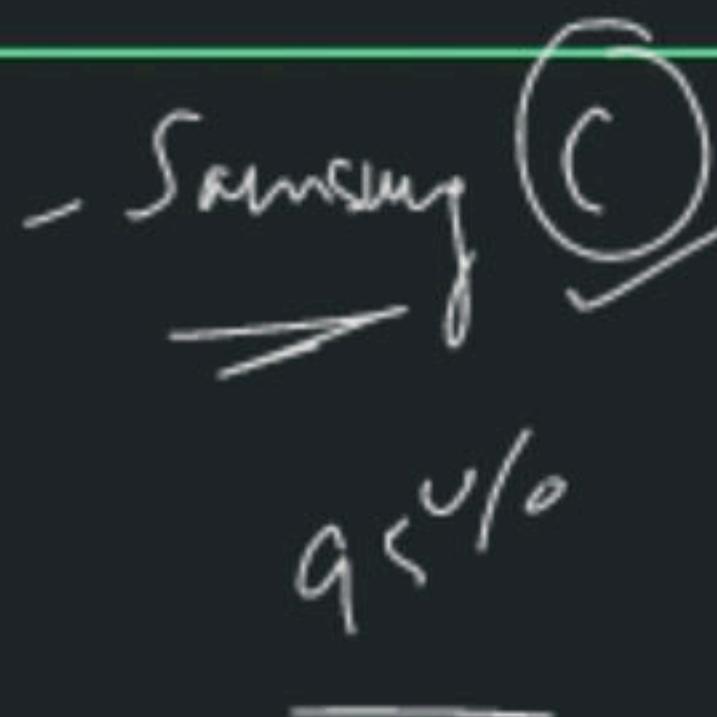
6:00 PM → C++, OOPs, CP problem

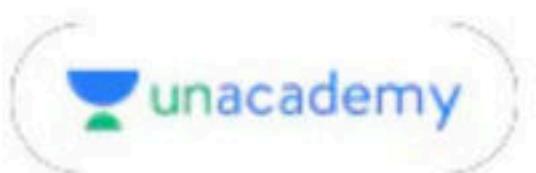
C++, OOPs, Programming

Operators and Precedence Table ✓

Ravindrababu Ravula
Jay Bansal

unacademy.com/@ravula
unacademy.com/@jay.bansal





CODECHEF

New Batch Launch

Gate

Triumph -
Beginner to Expert Level Coder in 12 Months



Happy
WOMEN'S
Day



Operators

- Arithmetic Operators ✓
- Comparison Operators ✓
- Logical Operators ✓
- Bitwise Operators ✓
- Assignment Operators ✓
- Miscellaneous Operators ✓



Arithmetic Operators

Operator	Name	Description	Example
+	Addition	Adds together two values	a+b
-	Subtraction	Subtracts one value from another	a-b
*	Multiplication	Multiplies two values	a*b
/	Division	Divides one value by another	a/b
%(circled)	Reminder	Returns the division remainder	a%b
++	Increment	Increases the value of a variable by 1	a++
--	Decrement	Decreases the value of a variable by 1	a--

$$5 \% 3 = ?$$

Comparison Operators

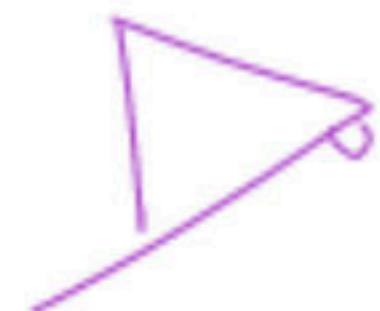
Operator	Name	Example
<code>==</code>	Equal to	<code>a==b</code>
<code>!=</code>	Not equal to	<code>a!=b</code>
<code>></code>	Greater than	<code>a>b</code>
<code><</code>	Less than	<code>a<b</code>
<code>>=</code>	Greater than or equal to	<code>a>=b</code>
<code><=</code>	Less than or equal to	<code>a<=b</code>

Handwritten notes:

- $a = 0, b = 1000 \pi$
- $a == b$ ✓ (True)
- $a != b$ (False)
- $a > b$ ✓ (False)
- $a < b$ ✓ (True)
- $a >= b$ (True)
- $a <= b$ (False)
- $c++$
- $0 \rightarrow \text{false}$
 $\rightarrow \text{True}$

Logical Operators

Operator	Name	Description	Example
&&	Logical and	Returns true if both statements are true	<code>a==b && b!=c</code>
 	Logical or	Returns true if any of the statements is true	<code>a!=b b>c</code>
!	Logical not	Returns true if the result is false	<code>!(a>b)</code>



Bitwise Operators

$$\text{A} = \begin{smallmatrix} 1 & 0 & 1 & 1 & 0 & 1 \\ \underline{-} & \underline{-} & \underline{-} & \underline{-} & \underline{-} \\ 0 & 1 & 1 & 0 & 1 \end{smallmatrix} = 3 \quad x \oplus x = 0$$

Operator	Name	Description	Example
&	Bitwise AND	AND on every bit of two numbers	a&b
	Bitwise OR	OR on every bit of two numbers	alb
<u>^</u>	Bitwise XOR	XOR on every bit of two numbers	a^b
<u><<</u>	Left shift	left shifts the bits of the first operand, the second operand decides the number of places to shift	a<<3
<u>>></u>	Right shift	right shifts the bits of the first operand, the second operand decides the number of places to shift	a>>3
~	Bitwise NOT	Takes 1's complement of the number	~a

Assignment Operators

Operator	Example	Equivalent to
=	a = 3	a = 3
+=	a += 3	a = a+3
-=	a -= 3	a = a-3
*=	a *= 3	a = a*3
/=	a /= 3	a = a/3
%=	a %= 3	a = a%3
=	a = 3	a = a 3
^=	a ^= 3	a = a^3
>>=	a >>= 3	a = a>>3
<<=	a <<= 3	a = a<<3

Comparison Operators

Three-way comparison operator, $\langle\Rightarrow\rangle$ (C++ 20)

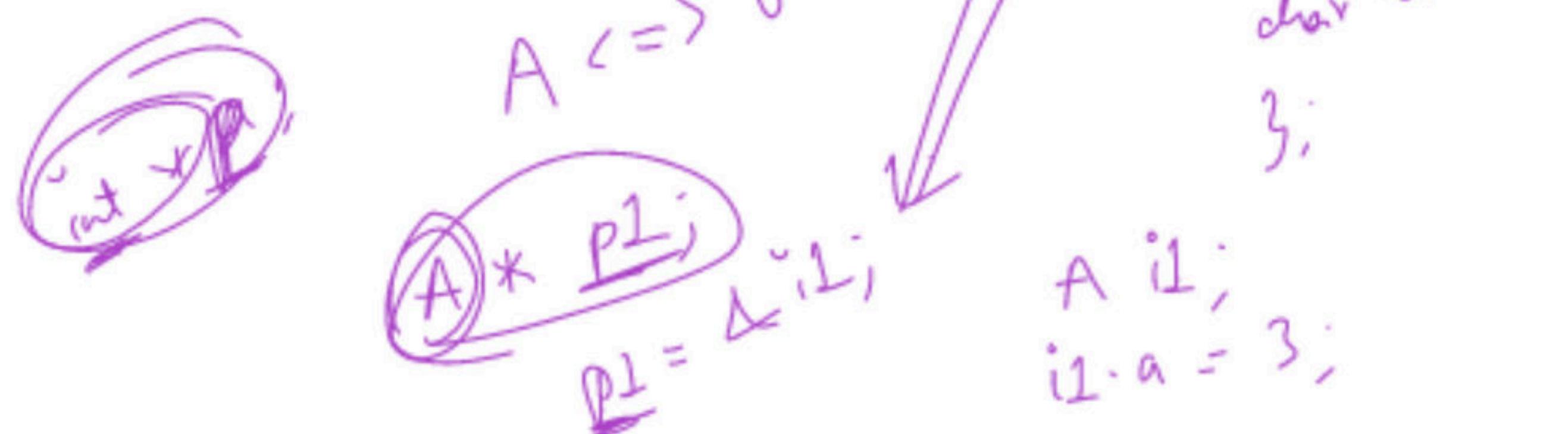
Also called "Space Ship operator"

- $(A \langle\Rightarrow\rangle B) < 0$ is true if $A < B$
- $(A \langle\Rightarrow\rangle B) > 0$ is true if $A > B$
- $(A \langle\Rightarrow\rangle B) == 0$ is true if A and B are equal/equivalent.

eg.

if ($3 \langle\Rightarrow 4 < 0$)

cout << "Yes" << endl;



Miscellaneous Operators

① Precedence ✓
② Associativity a.att1
 (* p(x)).att1
 ↓ P
 P
 → att1

Operator	Name	Description	Example
?:	Conditional Operator	shorthand for if-else ✓	a>0 ? a : -a
sizeof()	Sizeof Operator	returns size of a variable	sizeof(a)
.(dot)	Member operator	used to reference individual members of class/struct/union	object.a = 5 (a = b)? cout <wir
->(arrow)	Member operator	used to reference individual members of class/struct/union	ptr->a = 5
&	Pointer operator	returns the address of a variable	&a
*	Pointer operator	used to dereference, to get variable value	*ptr
,	comma operator/separater	used in declarations, loops etc	for(;i++, j--)

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=2, b=4;
    b +=(a -= 6);
    cout<<a<<b<<endl;
    return 0;
}
```

Output ?

- ① both operators are argument
 - equal precedence
 - ② right to left
 - ③ assignment operator has assigned value

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=2, b=4;
    b += a -= 6;
    cout<<a<<b<<endl;
    return 0;
}
```

Output ?

-40

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=1, b=22, c=2, x;
    ① x = ((a==b) != c); ←
    cout<<x; ②
    x = a ③ == (b != c);
    cout<<x; ④
    return 0;
}
```

Output ?

a) 1
b) 01
c) 10
d) 00

x@37-7113:

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=1, b=22, c=2, x;
    x = a==b != c;
    cout<<x;
    x = a == (b!=c);
    cout<<x;
    return 0;
}
```

Output ?

11

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=5, b=3, c=1;
    int result = c-- && ++b && a--;
    cout<<a<<b<<c<<endl;
    return 0;
}
```

Output ?

- a) 5 3 1
- b) 4 4 0 ✓
- c) 5 3 0
- d) None

Ans:

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=5, b=3, c=1;
    int result = c-- && ++b && a--;
    cout<<a<<b<<c<<endl;
    return 0;
}
```

Output ?

440

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=5, b=3, c=1;
    int result = (--c && ++b) && (a--);
    cout<<a<<b<<c<<endl;
    return 0;
}
```

Output ?

- a) 531
- b) 440
- c) 530
- d) None

Hint :- short circuiting

Practice

```
#include<iostream>
using namespace std;
int main(){
    int a=5, b=3, c=1;
    int result = --c && ++b && a--;
    cout<<a<<b<<c<<endl;
    return 0;
}
```

Output ?

530

Practice

Codechef : <https://www.codechef.com/problems/CATSDOGS>

~~✓~~

CATSDOGS

Codechef

Intermediate -

Beginner -

0-10+

5-10 min

60 min

Chef is a farmer and a pet lover. He has a lot of his favorite pets cats and dogs in the barn. He knows that there are **C** cats and **D** dogs in the barn. Also, one day went to field and found that there were **L** legs of the animals touching the ground.

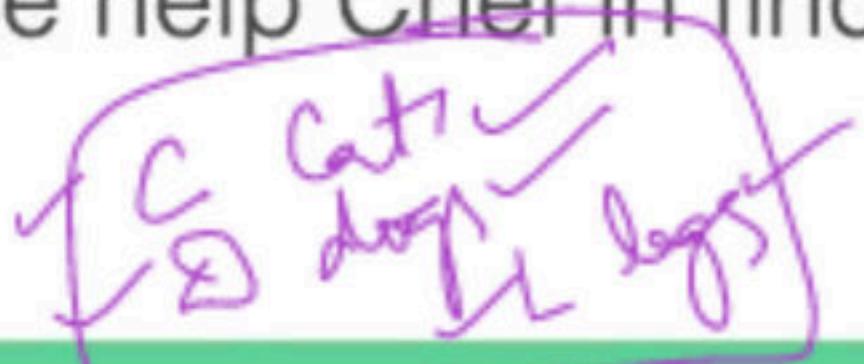
Chef knows that cats love to ride on the dogs. So, they might ride on the dogs, and their legs won't touch the ground and Chef would miss counting their legs.

Chef's dogs are strong enough to ride at max two cats on their back.

It was a cold foggy morning, when Chef did this counting. So he is now wondering whether he counted the legs properly or not. Specifically, he is wondering whether it is possible that he counted correctly. Please help Chef in finding it.



$$\begin{array}{r} \text{C, D are} \\ \text{the} \\ \text{legs} \\ \hline \text{L} = \text{C} + \text{D} \end{array}$$



Corrrect
3 Dogs, 7 Cat
16 legs

Input

First line of the input contains an integer **T** denoting number of test cases. **T** test cases follow.

The only line of each test case contains three space separated integers **C**, **D**, **L** denoting number of the cats, number of the dogs and number of legs of animals counted by Chef, respectively.

Output

For each test case, output a single line containing a string "yes" or "no" (both without quotes) according to the situation.

Constraints

- $1 \leq T \leq 10^5$
 - $0 \leq C, D, L \leq 10^9$
-

Subtasks

Subtask #1 (20 points)

- $1 \leq T \leq 10^4$
- $0 \leq C, D \leq 10^2$

Subtask #2 (30 points)

- $1 \leq T \leq 10^5$
- $0 \leq C, D \leq 10^3$

Subtask #3 (50 points)

- Original constraints

Input:

3

1 1 8

1 1 4

1 1 2

Output:

yes

yes

no



CODECHEF

TOPIC WISE

BATCH STRUCTURE

TRIUMPH: Beginner to Expert Level Coder in 12 Months
(Launching on 8th March)

TOPIC WISE BATCH STRUCTURE

TRIUMPH: Beginner to Expert Level Coder in 12 Months

Week 1

Introduction to
Programming

Week 2 - 9

Flow Charts,
Loops, Variables &
I/O and Online
Judges

Week 10 - 13

Sorting & Searching
- Concepts And
Problem Solving

Week 14 - 19

Basic Data Structures
- Fundamentals and
Interview Specific
Problem Solving

Week 20 - 24

Additional Concepts
in C++/Java/Python

Week 25 - 26

Greedy Algorithms
with Classical
Problem Solving

TOPIC WISE BATCH STRUCTURE

TRIUMPH: Beginner to Expert Level Coder in 12 Months

Week 27-29

Advanced Data Structures - Square Root Decomposition & Complex Problems

Week 35 - 39

Discrete Mathematics

Week 30 - 31

Number Theory And Interview Questions

Week 40 - 44

Graph Algorithm- Fundamentals to Extensive Problem Solving

Week 32 - 34

Recursion on DP- Concept to Detail

Week 45 - 47

Segment Trees

TOPIC WISE BATCH STRUCTURE

TRIUMPH: Beginner to Expert Level Coder in 12 Months

Week 48 - 50

Advanced Dynamic
Programming

Week 51 - 53

Computational
Geometry

2 hours
~6 hours
~~6-10h~~

Meet Our Educators

**Tanuj Khattar**

ACM ICPC World Finalist - 2017, 2018. Indian IOI Team Trainer 2016-2018. Worked @ Google, Facebook, HFT. Quantum Computing Enthusiast.

**Sanket Singh**

Software Development Engineer @ LinkedIn | Former SDE @ Interviewbit | Google Summer of Code 2019 @ Harvard University | Former Intern @ISRO

**Pulkit Chhabra**

Codeforces: 2246 | Codechef: 2416 | Former SDE Intern @CodeNation | Former Intern @HackerRank

**Riya Bansal**

Software Engineer at Flipkart | Former SDE and Instructor @ InterviewBit | Google Women TechMakers Scholar 2018

**Triveni Mahatha**

Qualified ICPC 2016 World Final. Won multiple Codechef Long Challenges (India). ICPC Onsite Regionals' Problem setter and Judge. IIT Kanpur.

**Arnab Chakraborty**

Six Sigma Master Black Belt-IQF(USA),AMT by AIMA,NLP & PMP Trained,ITIL-APMG(UK),Control & Automation-ISA(USA),"Star Python"-Star Cert.(USA)

Meet Our Educators

**Himanshu Singh**

World Finalist ICPC 2020, Winner Techgig Code
Gladiators 2020, Winner TCC '19, 2020 CSE Graduate
from IIT BHU, Works at Nutanix

**Nishchay Manwani**

Hey I am Nishchay Manwani from CSE, IIT Guwahati
and I'm a Seven star on Codechef and International
Grandmaster on Codeforces.

**Utkarsh Gupta**

I'm a competitive programmer. I am red on CF and 6* on
Codechef. I have been teaching CP on various platforms
for approx a year.

**Arjun Arul**

ICPC World Finalist 2012 & 2013, Coach @ IOITC

**Deepak Gour**

ICPC World Finalist 2020 | Former Instructor
@InterviewBit | Software Engineer at AppDynamics

**Vivek Chauhan**

Codechef: 7 stars (2612) India Rank 6, Codeforces:
MASTER (2279), Won Codechef Long Challenges(India),
TCO20 Southern Asia Runner up

Link to Unacademy CP course:

<https://unacademy.com/goal/competitive-programming/LEARNCP>

Link to Triumph batch:

<https://unacademy.com/batch/wizard-beginner-to-expert-level-coder-in-12-months/97N4LX9J>

JAY BANSAL SIR

</>

Expert in Competitive Programming
GATE CSE 2019 - AIR 2



**Incoming SDE @ Google
ACM ICPC 2019 - AIR 39
B.Tech Gold Medalist**



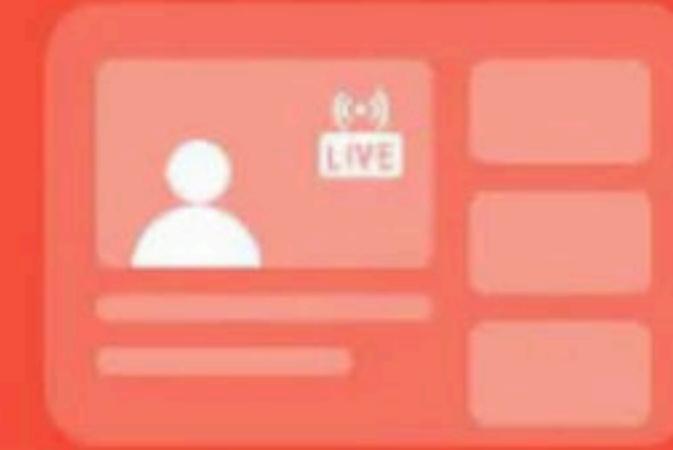
Subjects Taken:
Competitive Programming
C++
Data Structures
Algorithms
Interview Preparation

JAYCP

Get **10%** Off
on Unacademy
Plus Subscription

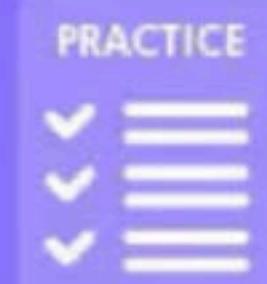


What You Will Get?



Live Interactive Classes

Attend live interactive classes with our top educators. Interact during class with educators to get all your doubts resolved.



Practice Relevant Problems @ Codechef

Each class comes with a set of curated practice problems to help you apply the concepts in real time.



Doubt Support

If you get stuck in any problem post class- Get your doubts resolved by our expert panel of teaching assistants and community members instantly.

</>

Competitive Programming subscription

Choose a plan and proceed

No cost EMI available on 6 months & above subscription plans

1 month

₹5,400
per month ₹5,400
Total (Incl. of all taxes)

3 months

₹4,800
per month ₹14,400
11% OFF Total (Incl. of all taxes)

6 months

₹4,050
per month ₹24,300
25% OFF Total (Incl. of all taxes)

12 months

₹2,475
per month ₹29,700
54% OFF Total (Incl. of all taxes)



JAYCP

Awesome! You got 10% off

Proceed to pay

4,70 2-3

6:50
~~CATSDO61~~

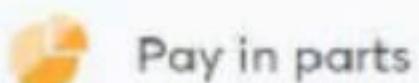


33,000/-





Choose a payment method



Pay in parts



Card



Net banking



UPI



Wallets



EMI

Debit Card EMI

Federal Bank - Debit card

NO COST EMI*

Axis Bank - Debit card

NO COST EMI*

Bank of Baroda - Debit card

NO COST EMI*

HDFC Bank - Debit card

NO COST EMI*

Kotak Mahindra Bank - Debit card

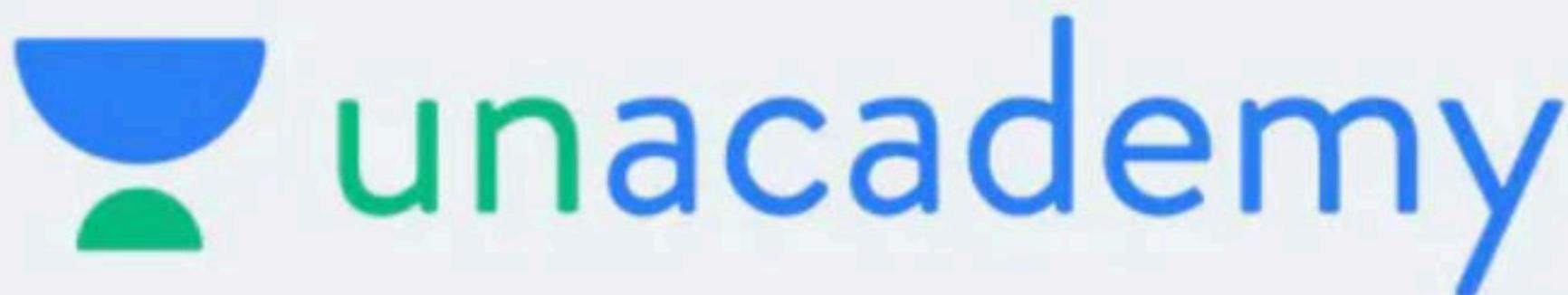
NO COST EMI*

Cardless EMI

Bajaj Finserv - Cardless

NO COST EMI*

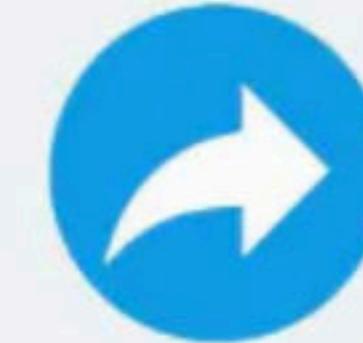
Follow Me on



<https://unacademy.com/@jay.bansal>

</>

Thank You



 SUBSCRIBE

