Programming **101**

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By the end of this session

- You will know **FlowCharts and Diagrams**
- You will have deep understanding of problem solving and logic building from a **programmer's perspective**
- We will do a lot of **Hands-On Exercises** together!

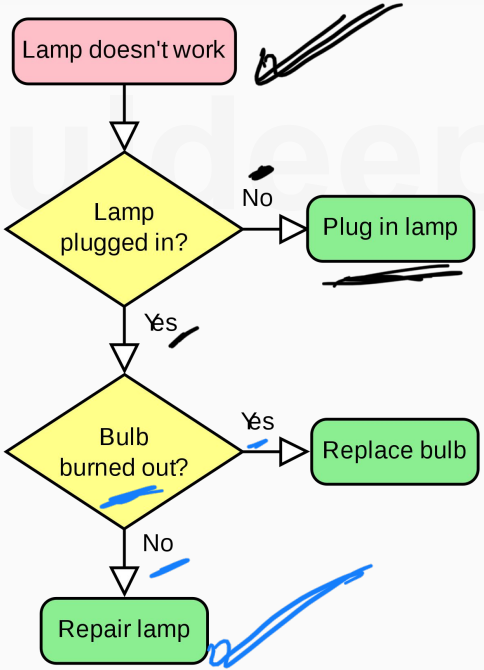
FlowChart

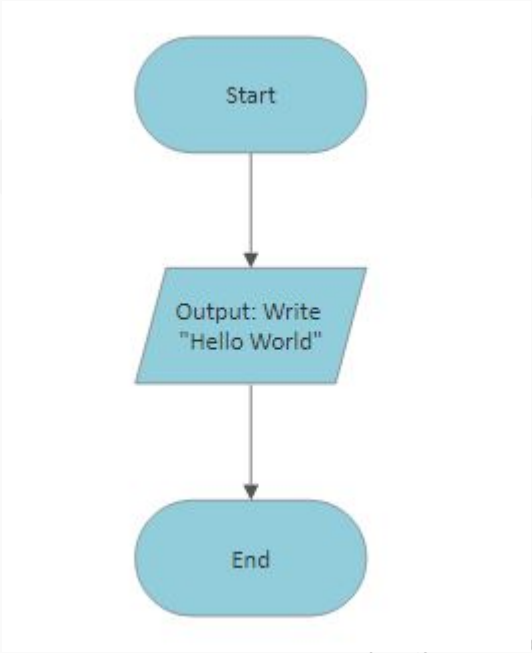
A flowchart is a graphical **representation of steps** to **solve problems**

OR

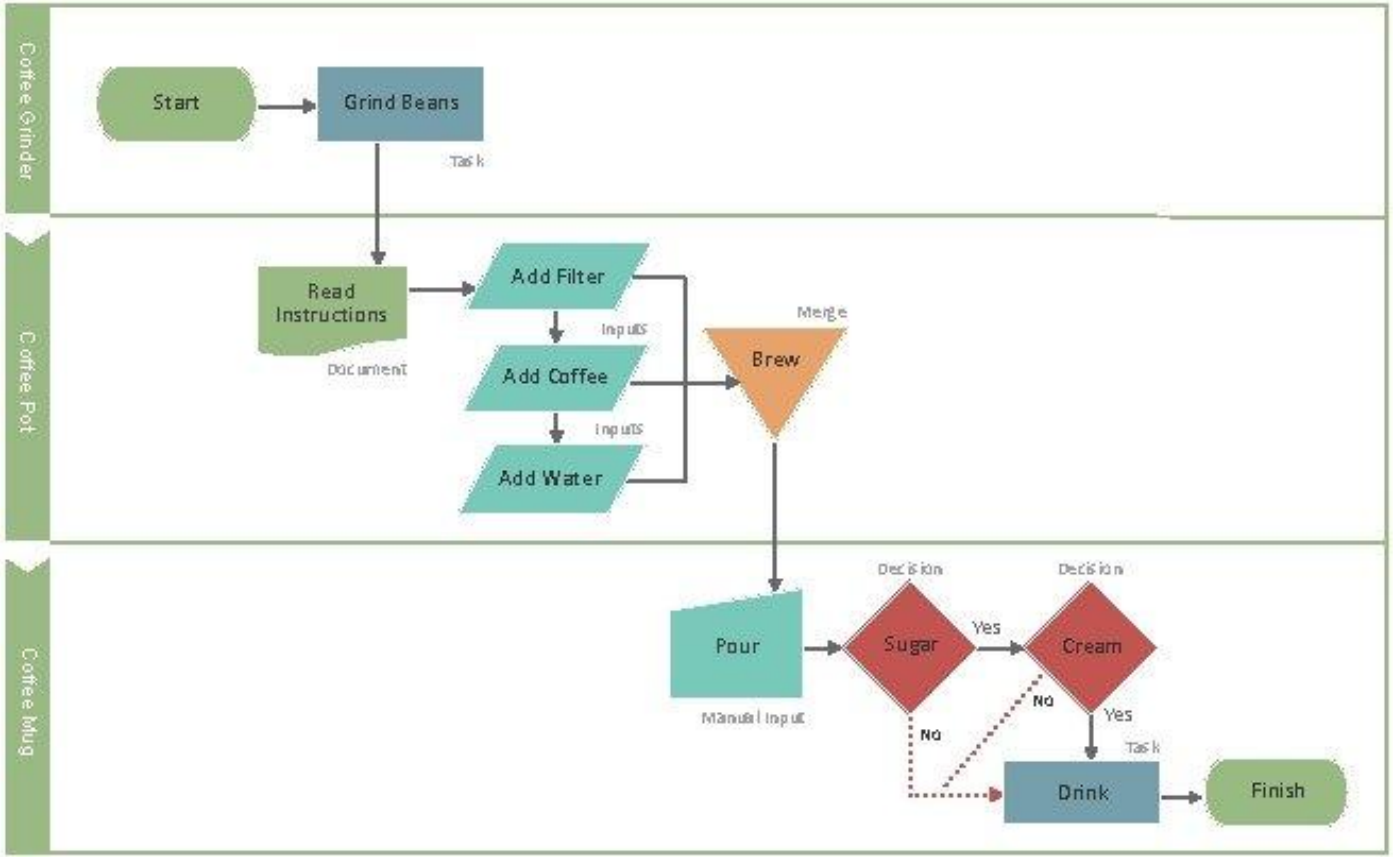
A tool we use to **represent the steps** to **solve a problem**.

Moving from day-to-day problems to technical problem statements



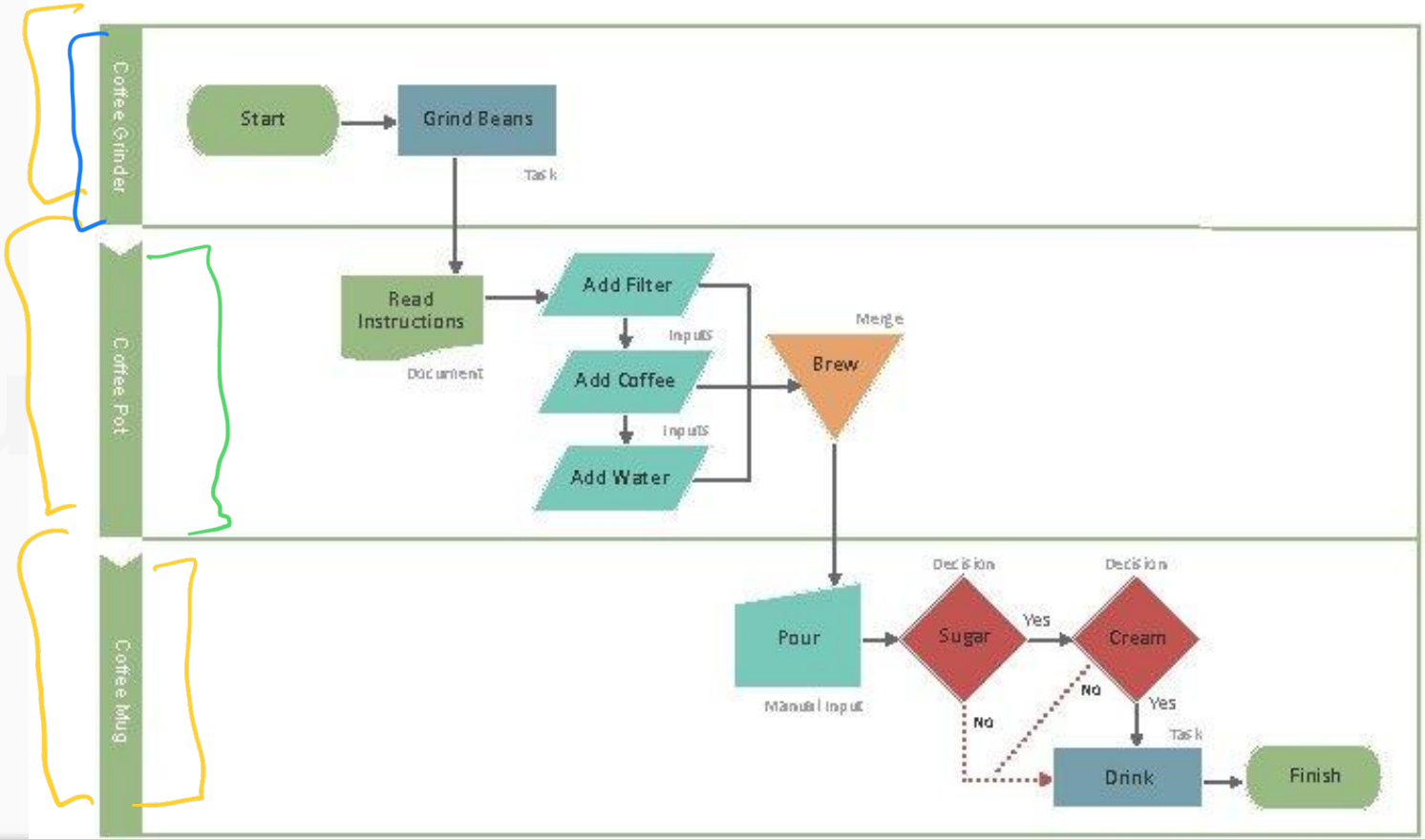


Flowchart Example: Brewing Coffee



What do we see here?

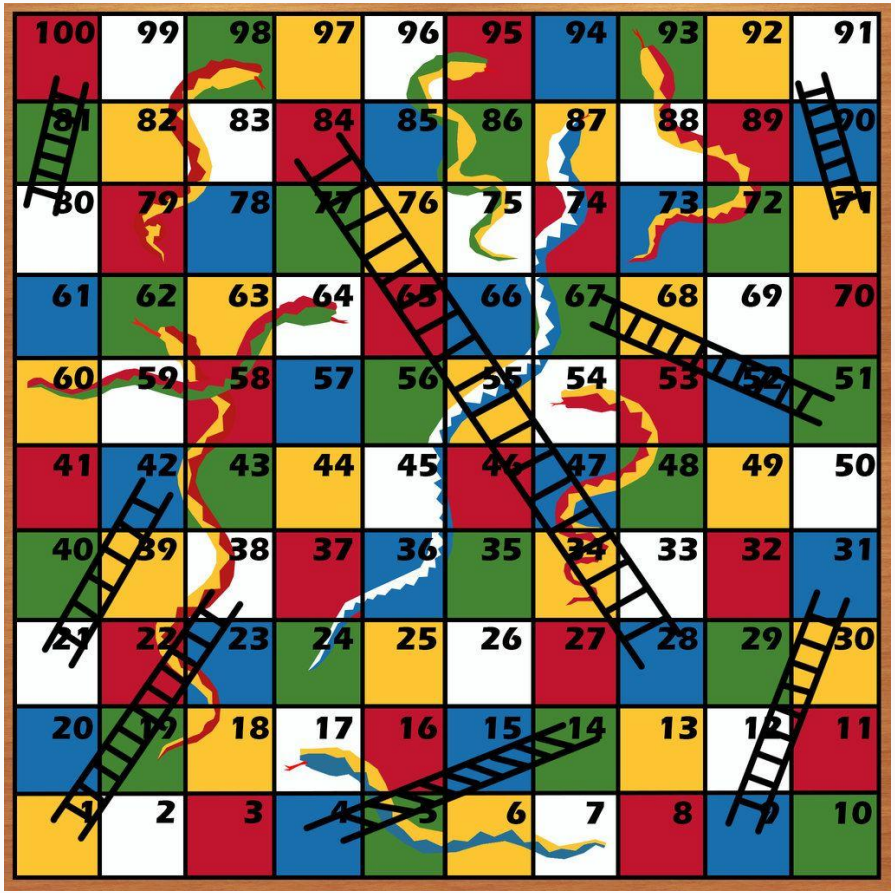
Flowchart Example: Brewing Coffee

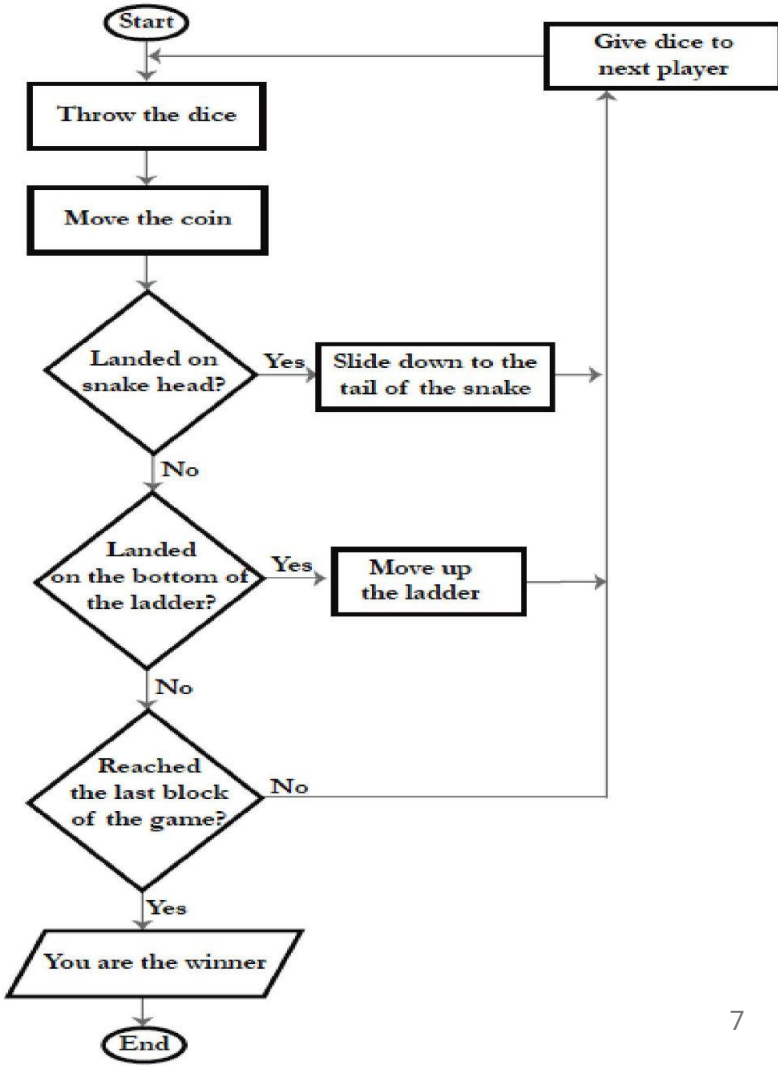


1. Divide the problem into smaller sections

2. Solve each section in step by step manner

Flowchart: Snakes and Ladders - Close look!





Flowchart: Snakes and Ladders - Algorithm

What is the perspective?

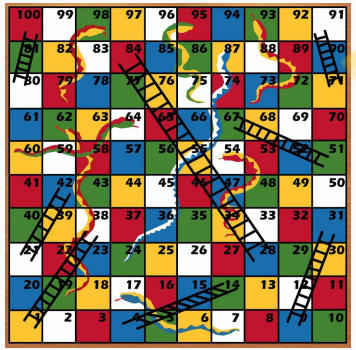
A: I was playing the game

B: Instruction are about how to play the game

If you wrote these instructions, who are you?

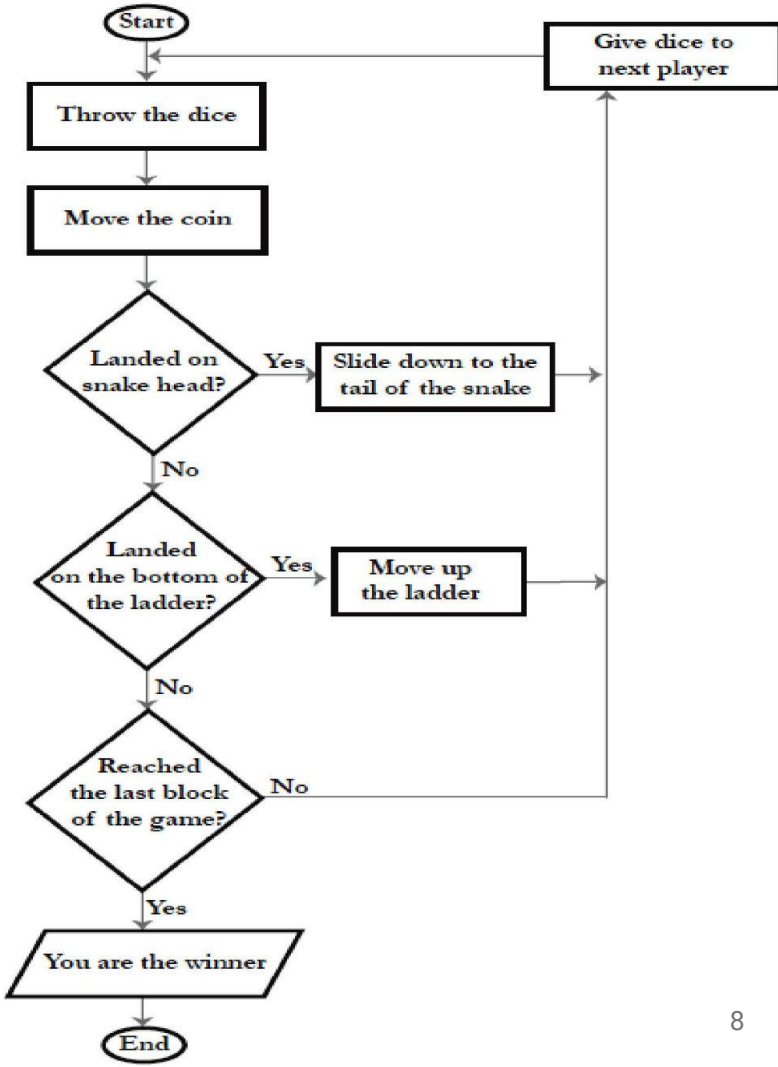
A: User

B: Creator



GENERIC

Algorithm



Exercise: Instructions to prepare TEA Format: Start--Steps--End

Input — Ingridients / Raw materials. — Water, tea leaves, milk

Process — Input → Output — Boil

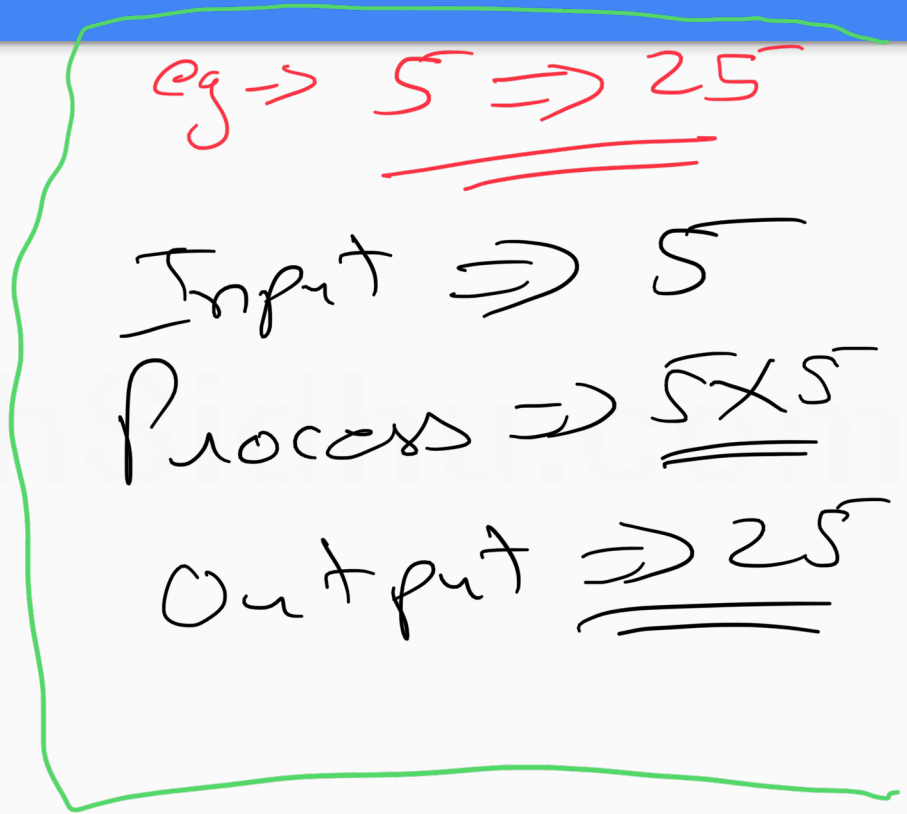
Output — Final Result — Tea

Exercise: Instructions to prepare TEA **Format: Start--Steps--End**

How computers work?

1. I - Input
2. P - Process [Converting Input to Output]
3. O - Output

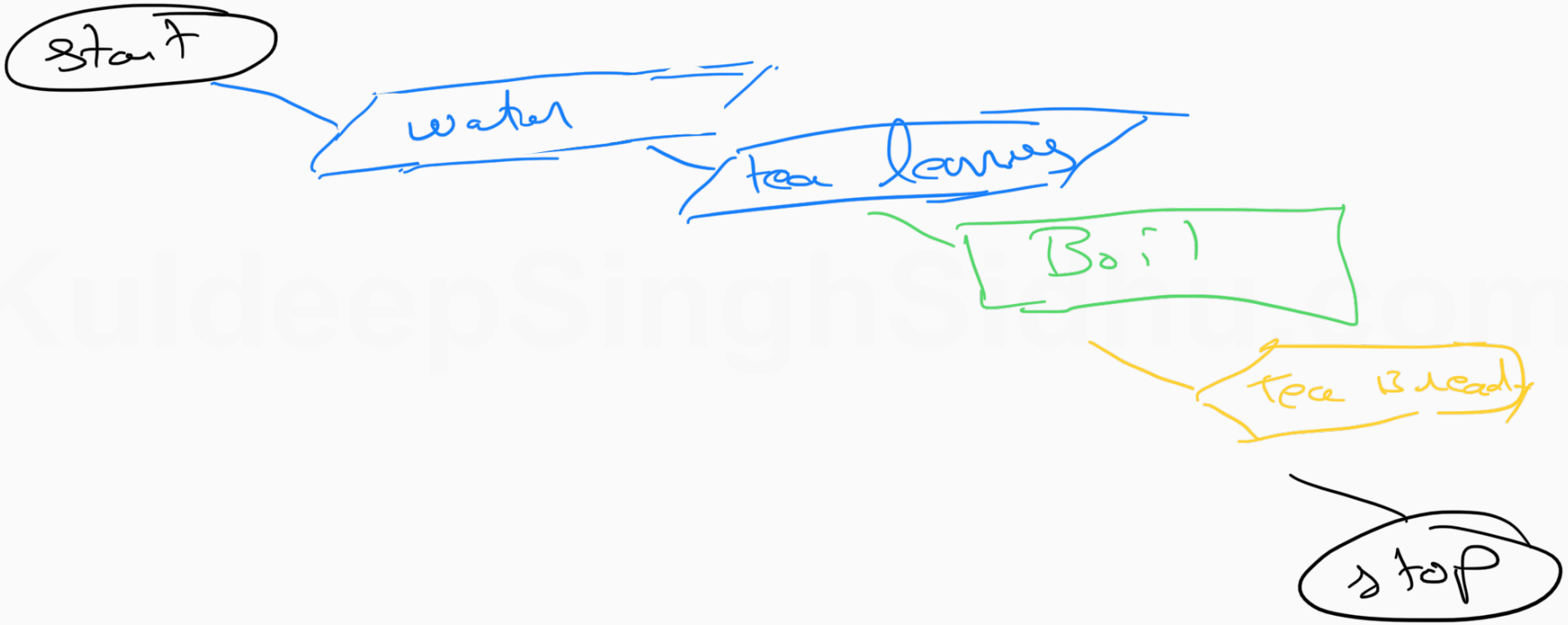
Exercise: Find the square of a given number Format: Start--Steps--End



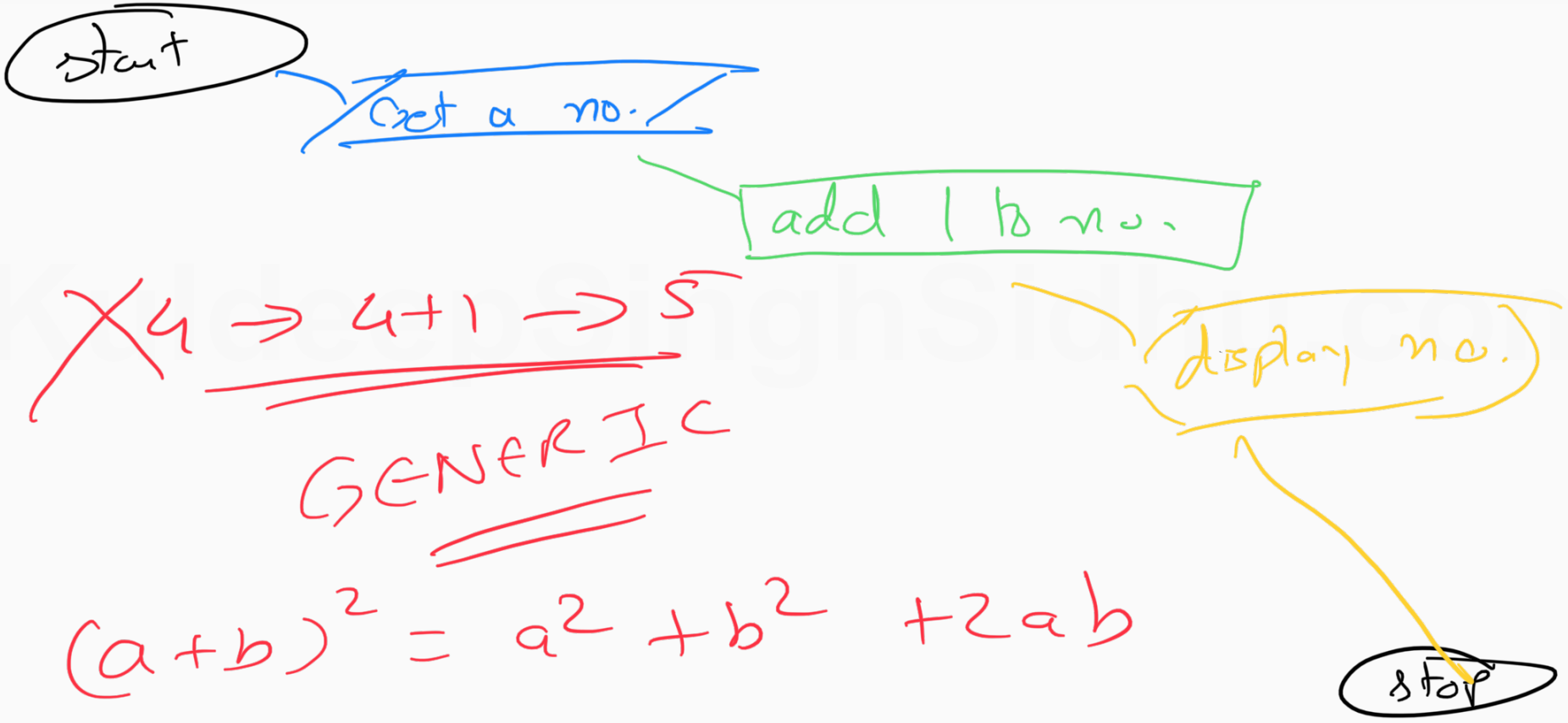
Flowchart diagrams

Input	
Process	
Output/ Display	
Start/Stop	
Decision	

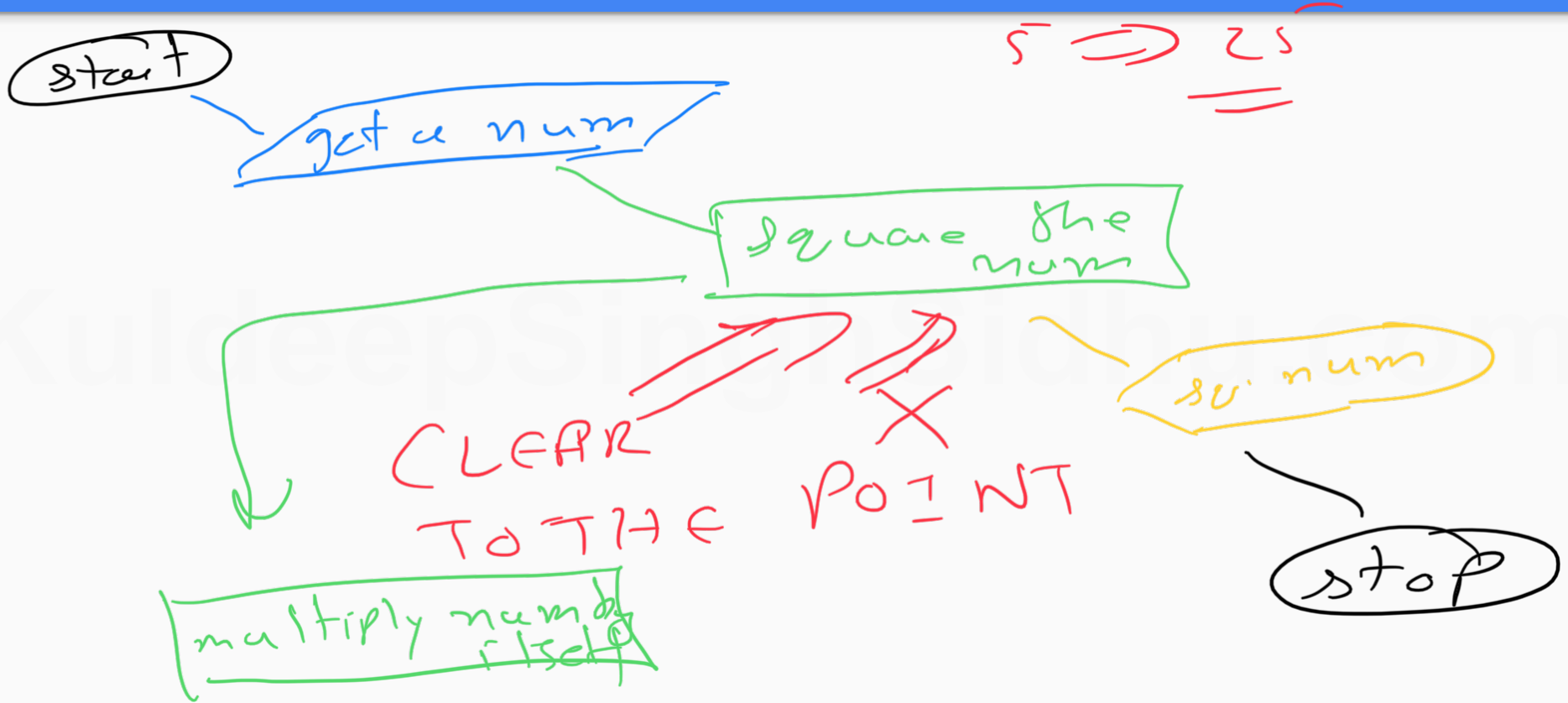
Exercise: Instructions to prepare TEA Format: Start--Steps--End



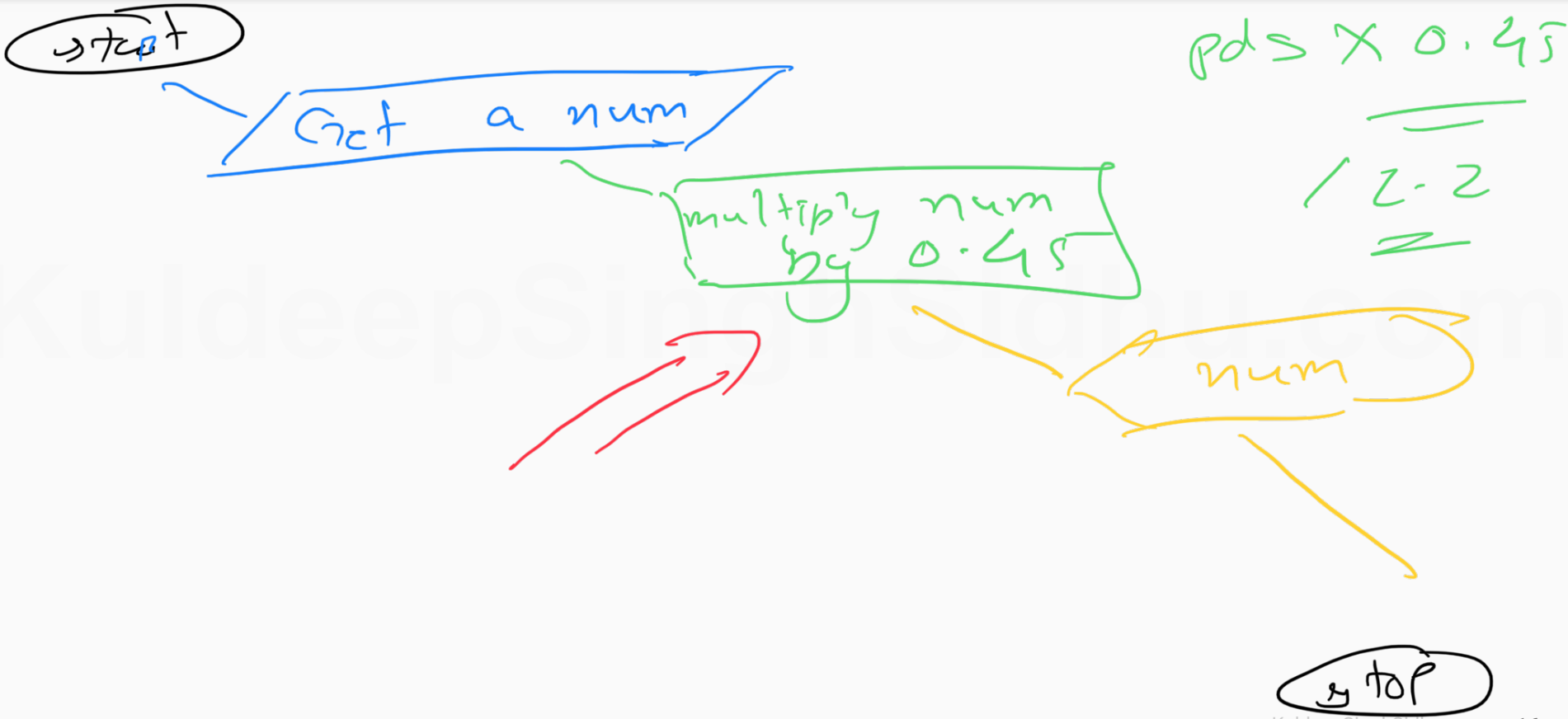
Let's try: Find the next number for a given number eg: input: 4, output:5
Format: Start--Steps--End



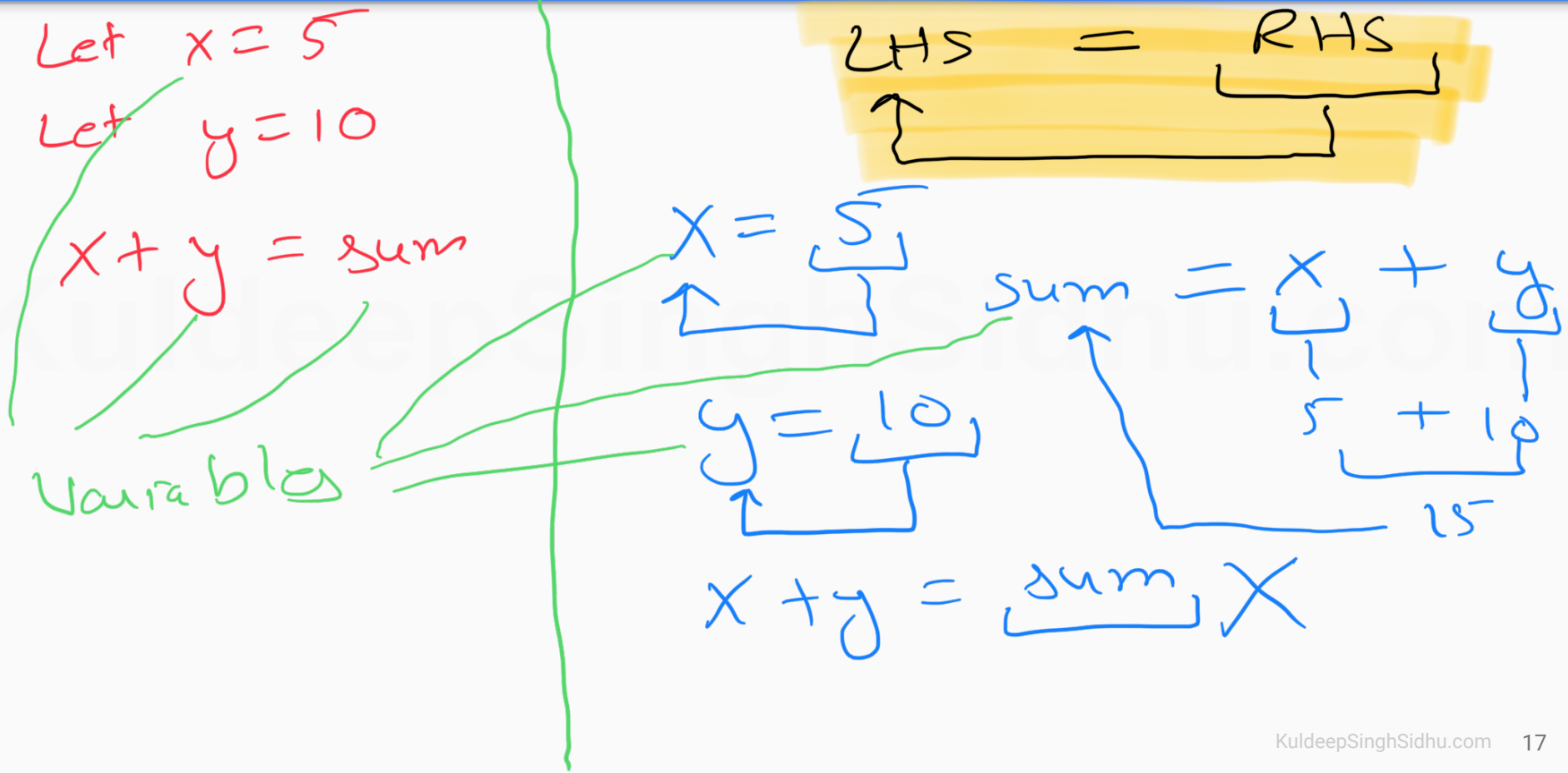
Exercise: Find the square of a given number Format: Start--Steps--End



Exercise: Write instructions to accept a number representing weight of a person in pounds/lb(s) and display the weight in Kilograms/Kg(s) >> *You can use Google*



Expressions



Exercise: Write expression to multiply a by 2 (assign to x) and b by 3 (assign to y)

a = 5
b = 10

x = a x 2

y = b x 3

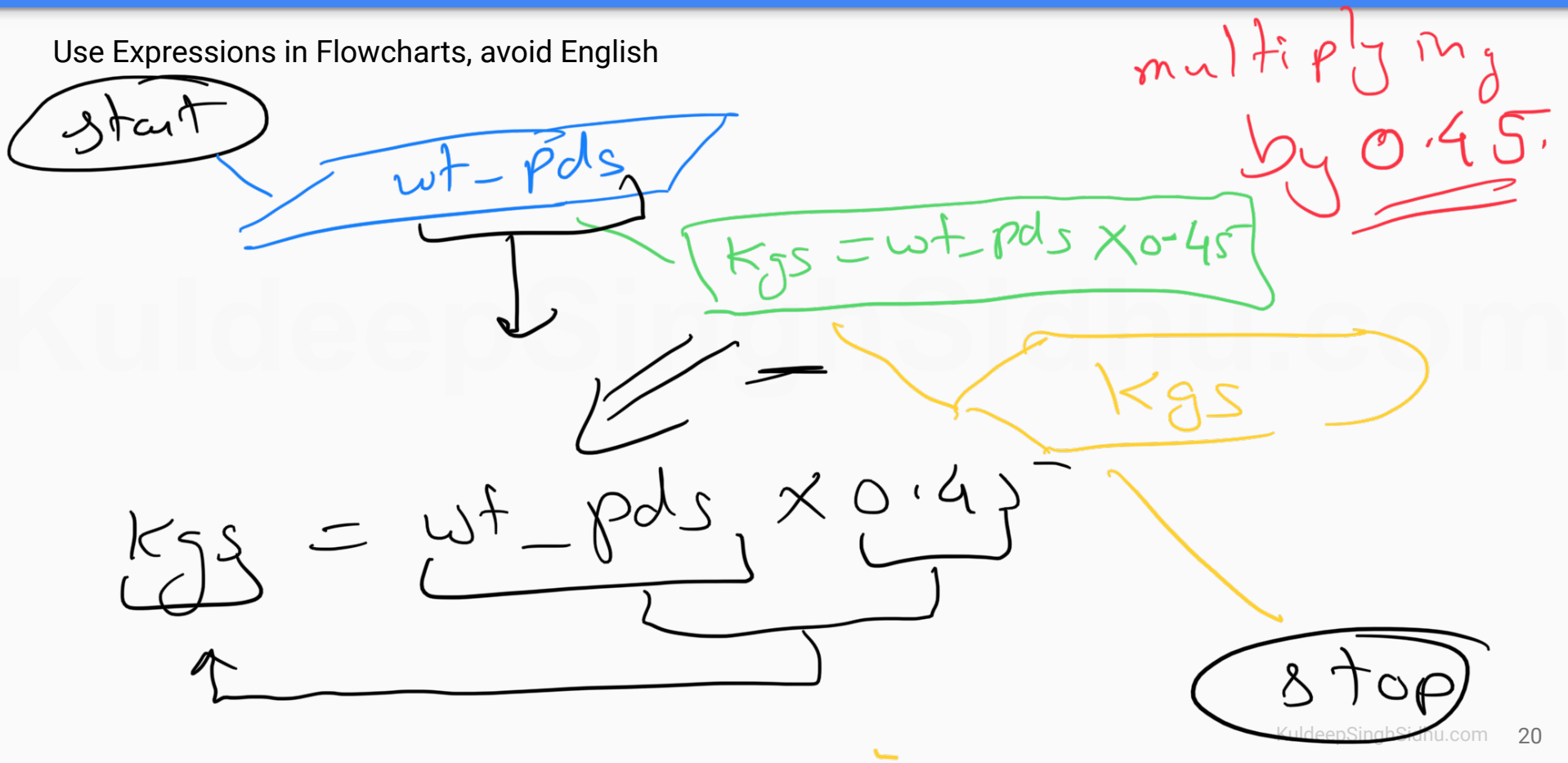
x = 2 x a

y = 3 x b

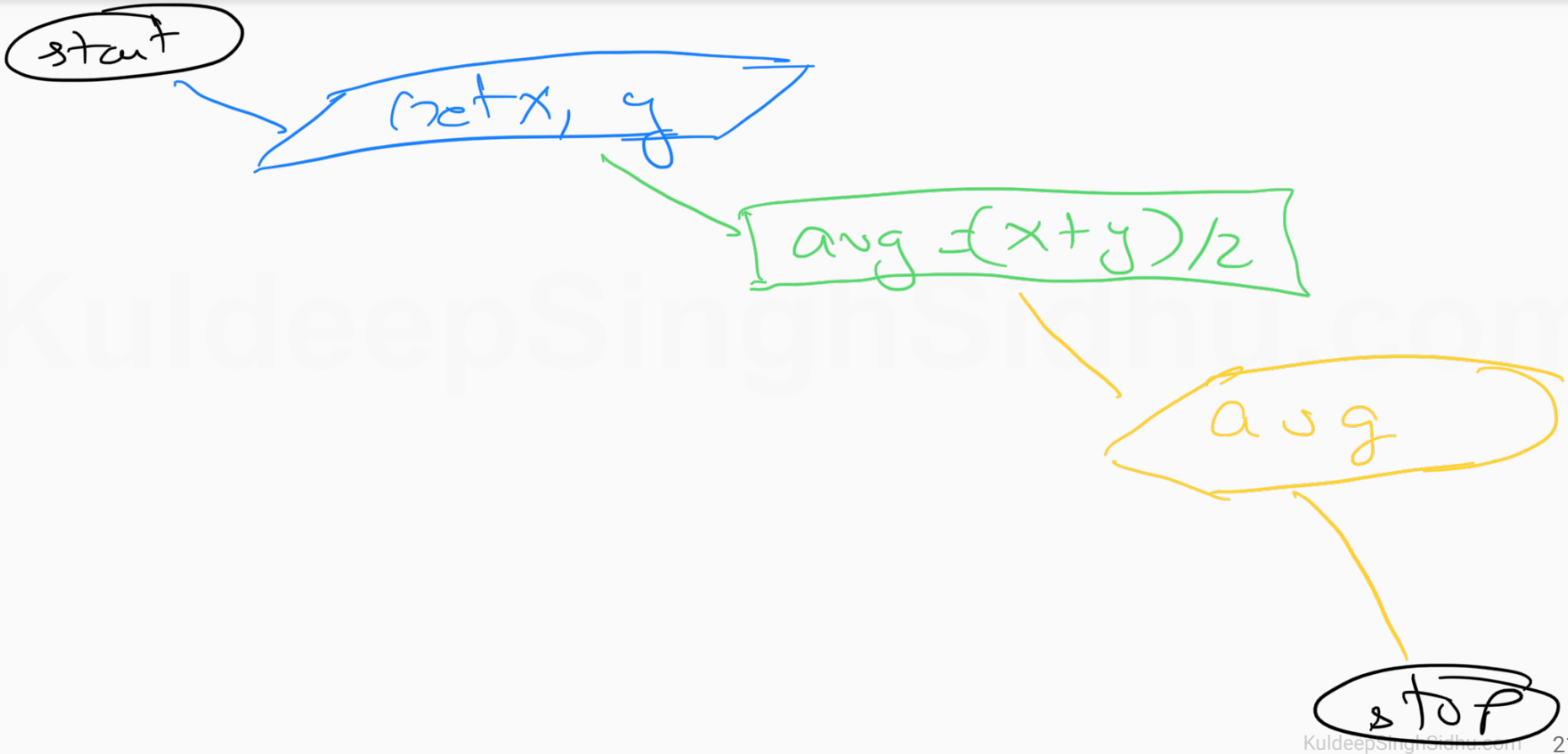
Exercise: Find the next number for a given number eg: input: 4, output:5
Format: Start--Steps--End EXPRESSIONS IN FLOWCHARTS

Exercise: Write instructions to accept a number representing weight of a person in pounds/lb(s) and display the weight in Kilograms/Kg(s) >> *You can use Google*

Use Expressions in Flowcharts, avoid English

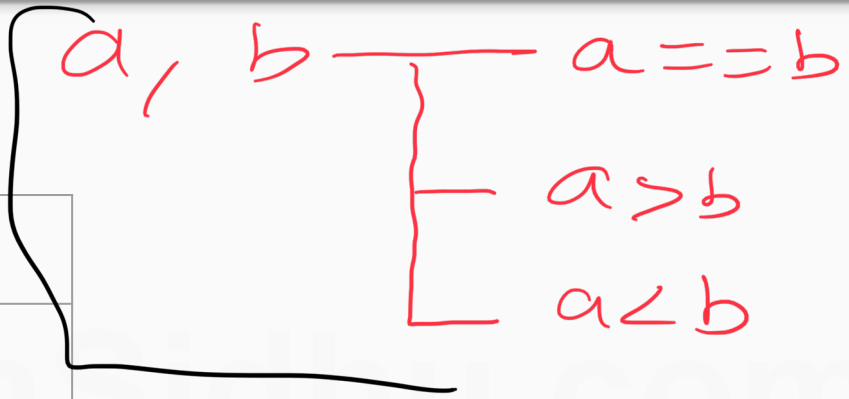


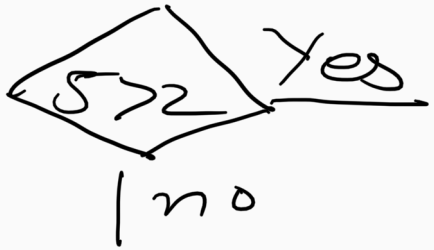
Exercise: Get 2 numbers and display their average



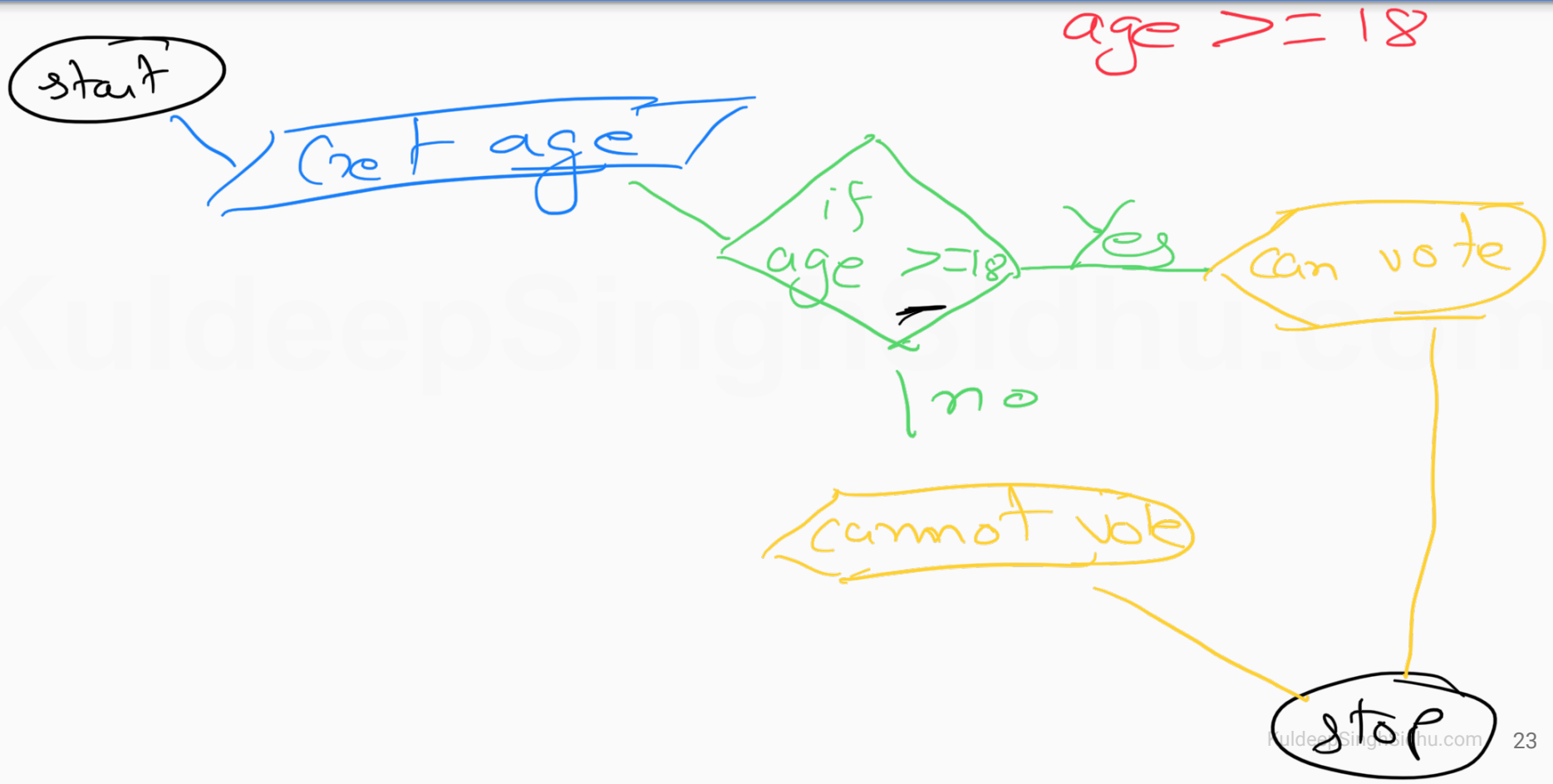
Decision making in flow charts

Input	
Process	
Output/ Display	
Start/Stop	
Decision	

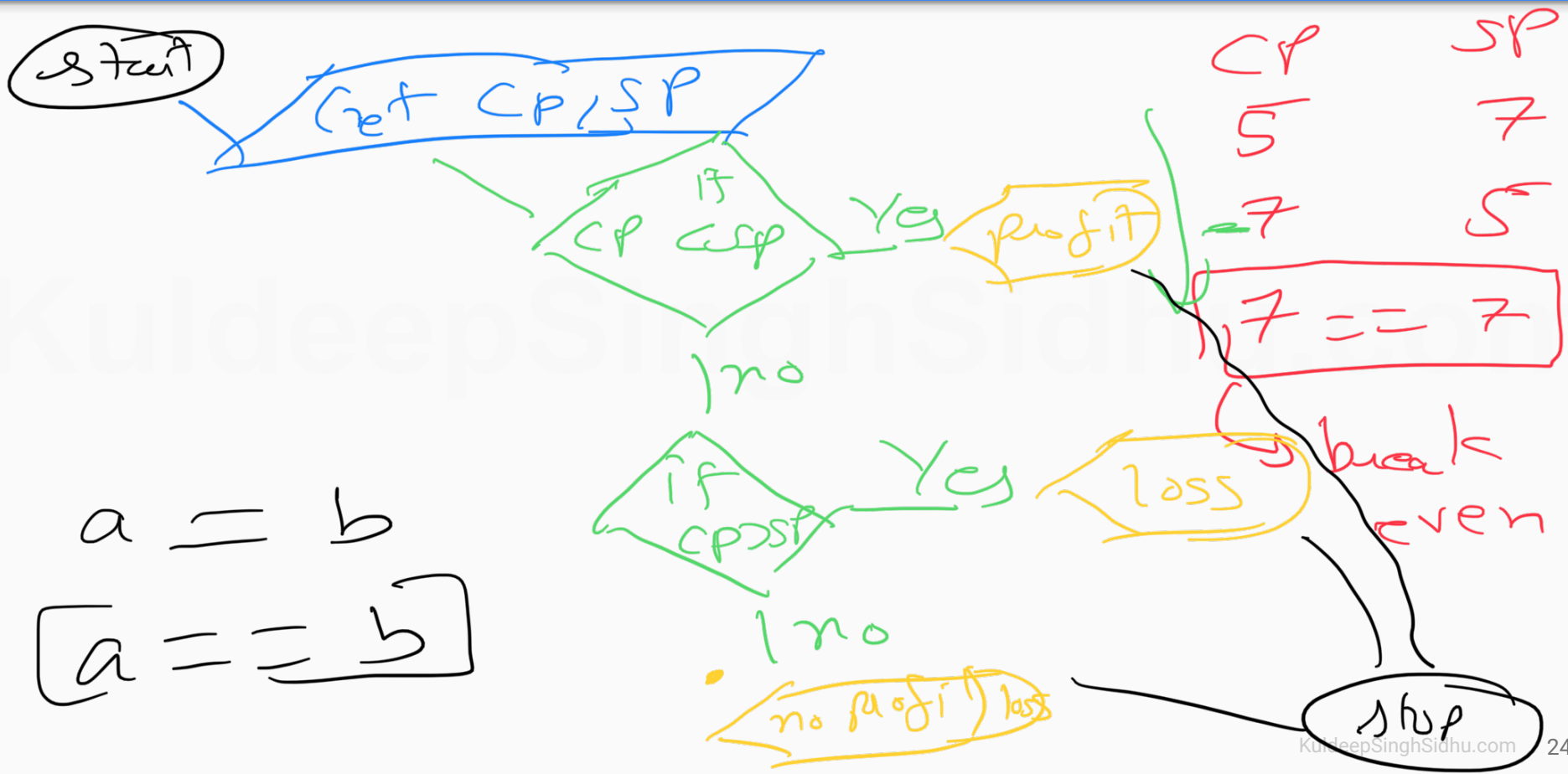




Decision making in flow charts: Let's write instructions that accepts age from the user and decides if the user can vote OR not



Exercise: Write instructions to accept Cost Price and Selling Price and check if it's a profit or loss



a = b

a == b

Flowchart to determine if the given no is +ve, -ve, neutral(zero)