

# PROBLEM SOLVING AND COMPUTATIONAL THINKING

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Day 1.

- ① CALCULATIVE SYSTEMATIC
- ② CONCEPTS FROM COMPUTER SCIENCE

OR ANYTHING

WHENEVER YOU HAVE  
A BIG PROBLEM

BREAK IT  
SHAKE IT  
CRUSH IT

## DECOMPOSITION

BREAKING DOWN PROBLEMS  
INTO SMALLER COMPONENTS

EAT THE CHUNKS

CHEW

FIND THE FLAVOURS

TOP NOTE

MIDDLE NOTE

BASE NOTE

## PATTERN RECOGNITION

OBSERVE PATTERNS AND  
TRENDS IN DATA

Focus on the Goal  
AND

AVOID IRRELEVANT DRAGS

## ABSTRACTION

REMOVING ASPECTS OF A  
PROBLEM  
THAT ARE NOT NEEDED  
FOR THE SOLUTION.

YOU NEED TO LEARN

① YOUR ROOMMATE

SNORES

YOUR GOAL

② THE MESS FOOD IS YUUCK.

③ YOU DIDNT STUDY

④ HEADACHES AFTER WEEKEND

⑤ BLAH BLAH BLAH

## ALGORITHM

DETERMINE THE STEPS  
REQUIRED TO SOLVE  
A PROBLEM.

A set of rules to solve a  
specific problem.

A well defined and finite set  
of steps/rules that, even if  
followed blindly, can  
solve the specified  
problem it has  
been designed for.

PLANNING IS IMPORTANT

① TAKE YOUR STEPS CAREFULLY

② THINK OF EVERY POSSIBILITIES  
AND BE PREPARED

## CASE STUDY:

→ Problem: Selecting appropriate clothing for a specific occasion or weather.

Computational Thinking Approach:

### DECOMPOSITION

Determine the occasion (e.g., formal, casual, work).  
Consider the weather (e.g., temperature, precipitation).  
Choose appropriate clothing items.  
Accessorize as needed.

### PATTERN RECOGNITION

Identify patterns in clothing choices based on different occasions and weather conditions. For example, formal events often require suits or dresses, while casual outings may call for jeans and a t-shirt.

### ABSTRACTION

Focus on the essential features of clothing that are relevant to the occasion and weather, such as comfort, style, and appropriateness. Ignore irrelevant details like the specific brand or color.

### ALGORITHM

1. Determine the occasion and weather.
2. Choose appropriate clothing items based on the occasion and weather.
3. Consider the color scheme and overall style.
4. Accessorize as needed.
5. Ensure the clothing is clean and in good condition.

Got it?

YOU CAN THINK OF SEVERAL

EDUCATIONAL OR

NON-EDUCATIONAL

EXAMPLES LIKE THE ABOVE.

✓

# ASSIGNMENT —

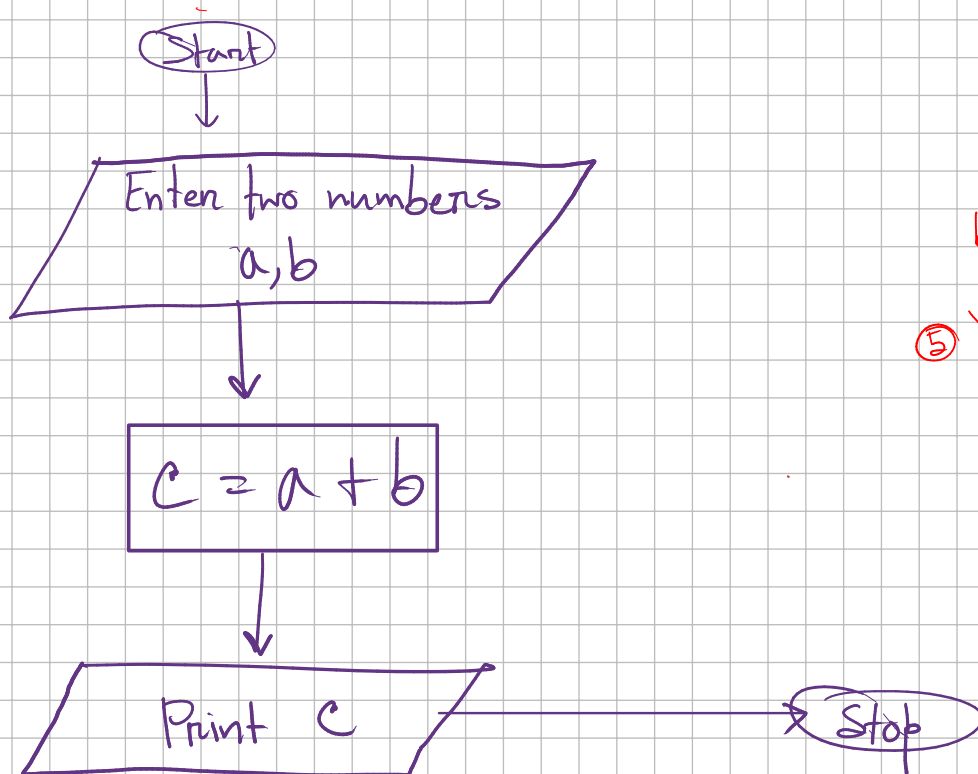
1. You and your roommate really enjoy the coffee which they serve at Rise but the problem is it tends to be occupied most of the time and it's very hard to find two empty chairs. How would you approach this problem using Computational Thinking? (5)
2. Think of a problem, write the problem statement and Solve it using Computational Thinking. (10)

Submit the aforementioned in a soft copy over Turnitin.

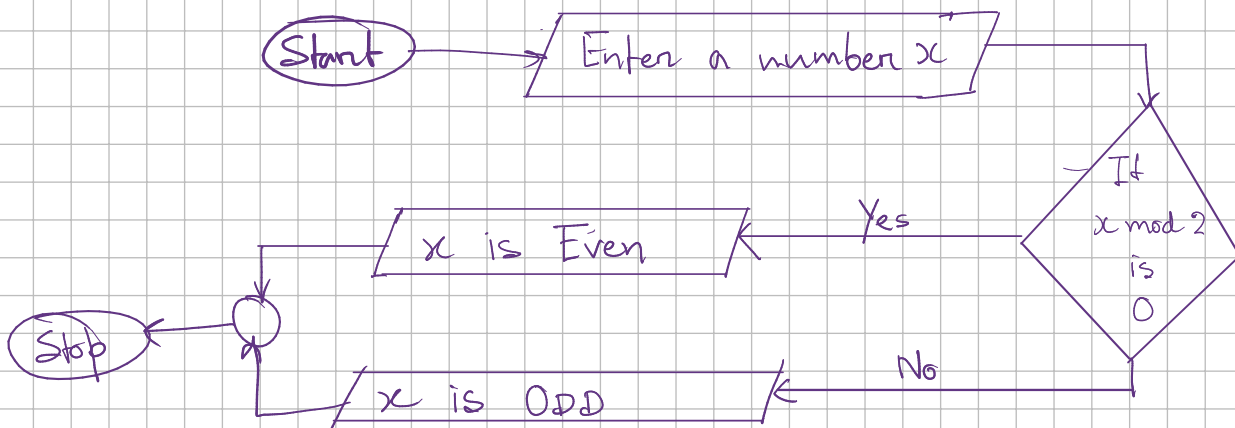
Flow Chart: A PICTORIAL REPRESENTATION OF ALGORITHM

To show the logical flow of the solution  
Using pictorial symbols

Example 1: Draw a flowchart to perform the summation of two given numbers.



Q) Draw a flowchart to show how to check if a given number is even or odd.



### Reference Board

① → To show the control flow

② → Start / Stop

③ → Processing

④ → Decision Box



Cond<sup>n</sup>:

① There should be exactly

two output branches.

but why?



Hub: To join the

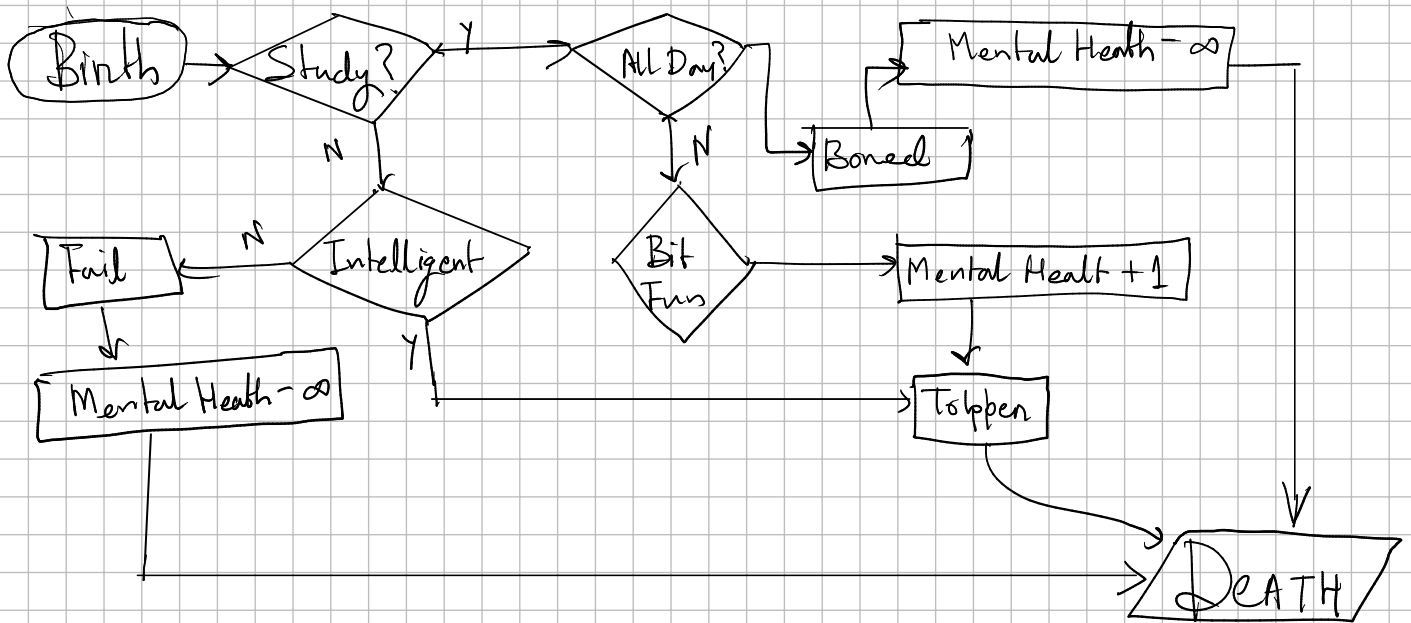
multiple input arrows to make the chart tidy.

So, where can we use a flowchart?

Be it any problem, maybe academic or not,  
wherever a logical flow of thought exist;  
we can use a flowchart.

Note: Multiple Decision blocks could be nested (joined).

Eg 1: Life of an Engineer.



H/W:

② Flow chart for prime factor

② FC to find a seat in Rise.

② GCD Algorithm

④ How to rob a bank and  
run away!!!

Enough for the  
Days