

Practice Questions on Computational Thinking

Attempt all of the following questions with utmost seriousness. Try each on your own to the best of your ability. Write your answers on your notebooks.

1. Recall our discussion on four techniques of computational thinking. Ponder on each technique for a moment. Think of your own examples/problems from day-to-day life (different from the ones we discussed) and expound on how you would apply each technique to tackle the problems.
2. Analyze the following systems/processes carefully and identify as many **expected inputs and outputs** of the system as possible. To start with, recall our discussion on inputs and outputs of ATM as a system.
 - a. Imagine the post office as a system/process. Trace the process of sending mail/courier right from the source to the destination. Identify possible inputs and outputs to/from the system.
 - b. Consider the process of driving a car. Analyze the process and identify as many inputs and outputs as possible.
 - c. Consider the process of making phone calls (telephone system in general). Identify as many inputs and outputs as possible in this system.

Try to foresee various possibilities (e.g. wrong receiver mail address, no fuel in the car, no balance in phone, etc).

3. Draw a flowchart for each process/system in question 2.
4. Write an **algorithm** to:
 - a. Compute the area and perimeter of a trapezoid/trapezium.
 - b. Calculate Body Mass Index (BMI) of a person and display either "Underweight", "normal", "Overweight" or "obese" depending on the value of the BMI (find out about the range of BMI values corresponding to each category).
 - c. Find the minimum of any 4 numbers.
 - d. Compute the GCD of two numbers using Euclid's method.
 - e. Display numbers from 1 to 100.
 - f. Display just EVEN numbers from 1 to 100.
 - g. Calculate the factorial of a given number.
5. Convert the above algorithms into **flowcharts**.
6. Develop **Trace Table** for each of the above algorithms (you may assume initial input number(s) to start your trace).

