**Question 3:** What are the key things you would consider when creating/consuming an API to ensure that it is secure and reliable?

Ans. ===============================🡺

1. Validating Input sent by the user before persisting in our database. We can make use of validation API in java.

2. Using strong Authentication and Authorisation, this ensures the person with right authority can access resources. We can make use Spring Security which provides built in strong security , we can add this security in our application by configuring it and can use different mechanism like OAuth2.0 with client id connect.

3. Exposing only limited data which is necessary. Sometimes some API contains password and other information that need not to be shared.

4. Avoid long wait times with timeouts and implements retries with exponential backoff

5. Provide meaningful and informative error responses and log issues for debugging.

6. Clearly document our API with tools like swagger to make it easy for consumers to use.

**Theoretical Challenge**

Suppose you have a CSV file with the data below.

A1: 5, A2: 7, A3: 9, B1: 3, B2: 8, B3: =4+5, C1: =5+A1, C2: =A2+B2, C3: =C2+B3I want a program that will take the CSV input above and produce CSV output with the results. If it is a value, then return a value. If it is a formula then calculate the formula and return the value of that formula.

1. How will you tackle the challenge above?

Ans. =================🡺

To solve the challenge , We can covert CSV input into a structured format such as a 2D array . Then, we can loop through the cells and check if it contains a formula or a value. If it is a value we can return the value and If it is a formula we can calculate it by using a formula parser and store the result. Finally, I would write the calculated values into a new CSV file.

1. What type of errors you would you check for?

Ans. ================🡺

Some errors that I would check for

Handle Circular References : A circular referenc occurs when two or more cells depend on each other, causing an infinite loop for ex., A1 = B1+1 and B1=A1+1. So, we need to handle circular references.

Syntax Error : Where the formula syntax is incorrect handle that cases. For ex., missing operators, mismatched parentheses.

Handle division by zero errors gracefully for ex., A1/0

Ensure that formulas are only applied to numerical values, not to strings or other non numeric types ex., “text”+1

Check if formula references a non-existent cell for ex., D1+5 when column D doesn’t exist.

1. How might a user break your code?

Ans. =================🡺

Following ways user can break our code :

By inputting invalid CSV format : not separating with commas properly

By using unsupported functions or formulas

By using incorrect cell references in formulas

By using providing invalid data types : non-numeric values in cells that are expected to contain numbers