◆ Code 1: Luhn Algorithm (Credit Card Validation)

Question:

```
*1. Code for LUHN Algorithm*
- Remove the rightmost digit from the card number. This number is called the
checking digit, and it will be excluded from most of our calculations.
- Reverse the order of the remaining digits.
- For this sequence of reversed digits, take the digits at each of the even
indices (0, 2, 4, 6, etc.) and double them.
-  If any of the results are greater than 9, subtract 9 from those numbers.
- Add together all of the results and add the checking digit.
- If the result is divisible by 10, the number is a valid card number. If it's
not, the card number is not valid.
```

Objective:
To implement the **Luhn algorithm** for validating credit card numbers. It checks whether a given number is a valid card number based on specific digit manipulation rules.

Code Explanation:

1. A class `Luhn` is defined to encapsulate the validation process.
2. `__init__`: Initializes the length of the card number, an empty list for digits, and a checking digit.
3. `push`: Collects digits of the card number from the user until the required length is reached.
4. `pop`: Removes the last digit and stores it as the checking digit.
5. `sort`: Sorts the card number digits in descending order (for demonstration).
6. `check`:
    - Duplicates the digit list into a temporary list.
    - Doubles every second digit starting from index `0`.
    - If doubling gives a number > 9, subtracts 9.
    - Sums all values plus the checking digit.
    - If the sum is divisible by 10 → valid card, else invalid.

Output/Usage:

- When run with input:
  `5 8 9 3 8 0 4 1 1 5 4 5 7 2 8 9`
  → The program prints **“Valid Card Number”**.
- If digits don’t satisfy the Luhn check, it prints **“Invalid Card Number”**.

🔹 Code 2: Remove Punctuation from String

Question:

```
*2. Write a python program to remove punctuations from the given string?*
```

Objective:
To clean a string by removing unwanted punctuation characters and keeping only meaningful text.

Code Explanation:

1. Function `clean_string(text)` defines a string of punctuation marks.
2. Iterates over each character of the input text.
3. If the character is **not in punctuation**, it is added to the result.
4. Returns the cleaned text without punctuation.

Output/Usage:

- Input:
  `Hello!!! My name is Zainab...`
- Output:
  `Hello My name is Zainab`

🔹 Code 3: Sorting Words in a Sentence (Alphabetical Order)

Question:

```
*3. Write a python program to sort the sentence in alphabetical order?*
```

Objective:
To sort the words of a given sentence alphabetically.

Code Explanation:

1. Function `sort(sentence)` splits the sentence into words.
2. Uses **Bubble Sort** to compare and arrange words in alphabetical order.
3. Joins the sorted words back into a sentence.

Output/Usage:

- Input:
```
I love learning artificial intelligence
```
- Output:
```
I artificial intelligence learning love
```