Code Revival Challenge

Welcome to the Code Revival Challenge Round II

Congratulations on completing the first set of questions. You must be a good learner to solve questions so fast. In this intermediate-level challenge, you will debug two Python programs. Your task is to identify the bugs, fix the code, and make the programs work as intended. Read each problem carefully, test the code, and propose your fixes. Good luck!

1 Challenge 1: Python Todo List

The following program is a simple todo list manager that allows adding, viewing, and deleting tasks. However, it contains bugs that cause errors or incorrect behavior.

Broken Code

```
tasks =
def add_task(task):
    tasks.append(task)
    print("Task added successfully!")
def view_tasks():
    for i in tasks:
        print(f"{i + 1}. {tasks[i]}")
def delete_task(index):
    tasks.pop(index)
    print("Task deleted!"(
add_task("Buy groceries")
add_task("Finish assignment")
view_tasks()
delete_task(1)
view_tasks()
```

Task

- Identify the bugs in the code.
- Fix the code to correctly add, view, and delete tasks from the todo list.
- Ensure the program displays tasks with correct numbering (starting from 1) and handles deletions properly.

2 Challenge 2: Matrix Mean Calculator

This program is supposed to calculate the mean of a matrix either by row or by column, based on a specified mode ('row' or 'column'). However, it contains bugs that lead to incorrect mean calculations.

Broken Code

```
def calculate_matrix_mean(matrix: list[list[float]], mode: str)
   -> list[float]:
    means = []
    rows = len(matrix)
    cols = len(matrix[0])
    total = 0
    if mode == 'column':
        for j in range(cols):
            for i in range(rows):
                total += matrix[i][j]
            means.append(total / rows)
    else:
        for i in range(rows):
            for j in range(cols):
                total += matrix[i][j]
            means.append(total / cols)
    return means
a = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
c = []
d = []
c = calculate_matrix_mean(a, 'column')
d = calculate_matrix_mean(a, 'row')
print(c)
print(d)
```

Task

- Identify the bugs in the code.
- Fix the code to correctly calculate the mean of the matrix by row or by column, based on the specified mode.
- Ensure the program returns correct means for the given matrix, e.g., for the input matrix [[1, 2, 3], [4, 5, 6], [7, 8, 9]], column means should be [4, 5, 6] and row means should be [2, 5, 8].

Instructions

- For each challenge, explain the bugs you found and how you fixed them.
- Submit your corrected code along with a brief explanation of the changes.
- Ensure your code is well-commented to show your understanding.

- Have fun debugging!