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import csv
import statistics

class DataManager:
    def __init__(self, file_path):
        self.file_path = file_path
        self.data = self.read_data()

    def read_data(self):
        with open(self.file_path, 'r') as file:
            reader = csv.DictReader(file)
            data = [row for row in reader]
        return data

    def write_data(self):
        with open(self.file_path, 'w', newline='') as file:
            fieldnames = self.data[0].keys()
            writer = csv.DictWriter(file, fieldnames=fieldnames)
            writer.writeheader()
            writer.writerows(self.data)

    def add_data(self, new_entry):
        self.data.append(new_entry)
        self.write_data()

    def edit_data(self, index, updated_entry):
        self.data[index] = updated_entry
        self.write_data()

    def delete_data(self, index):
        del self.data[index]
        self.write_data()

    def analyze_data(self):
        expenses = [list(map(int, row.values())[1:]) for row in self.data]
        means = [statistics.mean(expense) for expense in zip(*expenses)]
        medians = [statistics.median(expense) for expense in zip(*expenses)]
        return means, medians

    def filter_data(self, field, value):
        filtered_data = [row for row in self.data if row[field] == value]
        return filtered_data

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class ConsoleApp:
    def __init__(self):
        self.data_manager = DataManager("sample_data.csv")
        self.run()

    def display_menu(self):
        print("\nMenu:")
        print("1. Read data from the file")
        print("2. Add data to the file")
        print("3. Edit existing data")
        print("4. Delete existing data")
        print("5. Analyze data (mean and median)")
        print("6. Filter data")
        print("7. Exit")

    def run(self):
        while True:
            self.display_menu()
            choice = input("Enter your choice (1-7): ")

            if choice == "1":
                print(self.data_manager.data)
            elif choice == "2":
                new_entry = {
                    "Month": input("Enter Month: "),
                    "Expense 1": input("Enter Expense 1: "),
                    "Expense 2": input("Enter Expense 2: "),
                    "Expense 3": input("Enter Expense 3: "),
                }
                self.data_manager.add_data(new_entry)
            elif choice == "3":
                index = int(input("Enter the index to edit: "))
                updated_entry = {
                    "Month": input("Enter Month: "),
                    "Expense 1": input("Enter Expense 1: "),
                    "Expense 2": input("Enter Expense 2: "),
                    "Expense 3": input("Enter Expense 3: "),
                }
                self.data_manager.edit_data(index, updated_entry)
            elif choice == "4":
                index = int(input("Enter the index to delete: "))
                self.data_manager.delete_data(index)
            elif choice == "5":

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        means, medians = self.data_manager.analyze_data()
        print("Mean:", means)
        print("Median:", medians)
    elif choice == "6":
        field = input("Enter the field to filter by: ")
        value = input(f"Enter the value for {field} to filter: ")
        filtered_data = self.data_manager.filter_data(field, value)
        print(filtered_data)
    elif choice == "7":
        break
    else:
        print("Invalid choice. Please enter a number between 1 and 7.")

if __name__ == "__main__":
    app = ConsoleApp()
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