In [ ]:

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import os
import json
from datetime import datetime

class BudgetTracker:
    def __init__(self, file_path):
        self.file_path = file_path
        self.transactions = []
        self.load_transactions()

    def load_transactions(self):
        if os.path.exists(self.file_path):
            with open(self.file_path, 'r') as f:
                self.transactions = json.load(f)

    def save_transactions(self):
        with open(self.file_path, 'w') as f:
            json.dump(self.transactions, f, indent=4)

    def add_transaction(self, category, amount, transaction_type):
        new_transaction = {'category': category, 'amount': amount, 'type': transaction_type, 'date': str(dateti
        self.transactions.append(new_transaction)
        self.save_transactions()

    def calculate_budget(self):
        income = sum(transaction['amount'] for transaction in self.transactions if transaction['type'] == 'inco
        expenses = sum(transaction['amount'] for transaction in self.transactions if transaction['type'] == 'ex
        remaining_budget = income - expenses
        return remaining_budget

    def categorize_expenses(self):
        expense_categories = {}
        for transaction in self.transactions:
            if transaction['type'] == 'expense':
                category = transaction['category']
                amount = transaction['amount']
                if category in expense_categories:
                    expense_categories[category] += amount
                else:
                    expense_categories[category] = amount
        return expense_categories

    def analyze_spending_trends(self):
        expense_categories = self.categorize_expenses()
        print("\nExpense Analysis:")
        for category, amount in expense_categories.items():
            print(f"{category}: ${amount}")


def main():
    file_path = "transactions.json"
    budget_tracker = BudgetTracker(file_path)

    while True:
        print("\n====== Budget Tracker ======")
        print("1. Add Income")
        print("2. Add Expense")
        print("3. Calculate Remaining Budget")
        print("4. Analyze Spending Trends")
        print("5. Exit")

        choice = input("Enter your choice: ")

        if choice == '1':
            category = input("Enter income category: ")
            amount = float(input("Enter income amount: "))
            budget_tracker.add_transaction(category, amount, 'income')
            print("Income added successfully!")

        elif choice == '2':
            category = input("Enter expense category: ")
            amount = float(input("Enter expense amount: "))
            budget_tracker.add_transaction(category, amount, 'expense')
            print("Expense added successfully!")

        elif choice == '3':
            remaining_budget = budget_tracker.calculate_budget()
            print(f"Remaining Budget: ${remaining_budget}")

        elif choice == '4':
            budget_tracker.analyze_spending_trends()
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        elif choice == '5':
            print("Exiting...")
            break

        else:
            print("Invalid choice. Please try again.")


if __name__ == "__main__":
    main()
```

```
====== Budget Tracker ======
1. Add Income
2. Add Expense
3. Calculate Remaining Budget
4. Analyze Spending Trends
5. Exit
```

In [ ]: