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Course Code and Name: 2CS303 Data Structures and Algorithms

Innovative Assignment: Personal Finance Tracker

AIM: software which help to maintain out transection records and represent it in well-organized form, set our wish-list as per priority of need, and maintain minimum financial transaction.

Nowadays people have so many tasks to do they always try do own best in all field but we observed that people have no time to maintain their financial records.

People always make mistake at time of transection like do multiple transections as per need of time but they do not think about cost of that transection time. let us understand it through example, person A gives Rs. 20 to person B and person B gives Rs. 20 to person C now at time of return they do exactly reverse person C return Rs. 20 to person B and person B return Rs. 20 to person A. in this case total transaction is 4. if person B told to person A send Rs. 20 to person C and at time of return person C return Rs. 20 to direct person A in this case total transaction is 2. Our intention is to do minimum transection.

People have so many wants and then will try to fulfill it as per First come first serve rule but in that case then forgot about real need so we help them to set priority on their wants.

Financial records: here we use linked list data structure and then store it in csv file, which is opened in Excel or other Spreadsheet applications.

Minimum cash flow: here we use directed & weighted graph data structure to find minimum transection which satisfied all needed transections. Which have time complexity $O(n^2)$.

Set priority to wish-list: here we use min heap sort algorithm and before it set priority on wishes. We have other option which is 2D priority queue but time complexity is $O(n^2)$ and time complexity of heap sort is O(n*log n) so we use min heap sort.

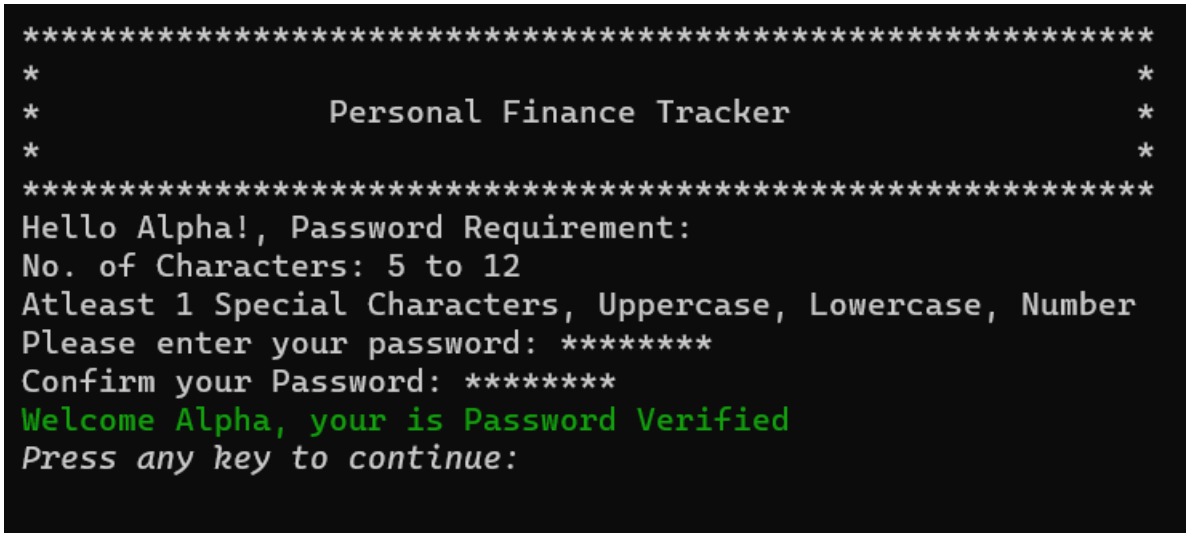
Flies used in handling: Records.csv is used to store transaction data and another file stores Login Credentials for future login.

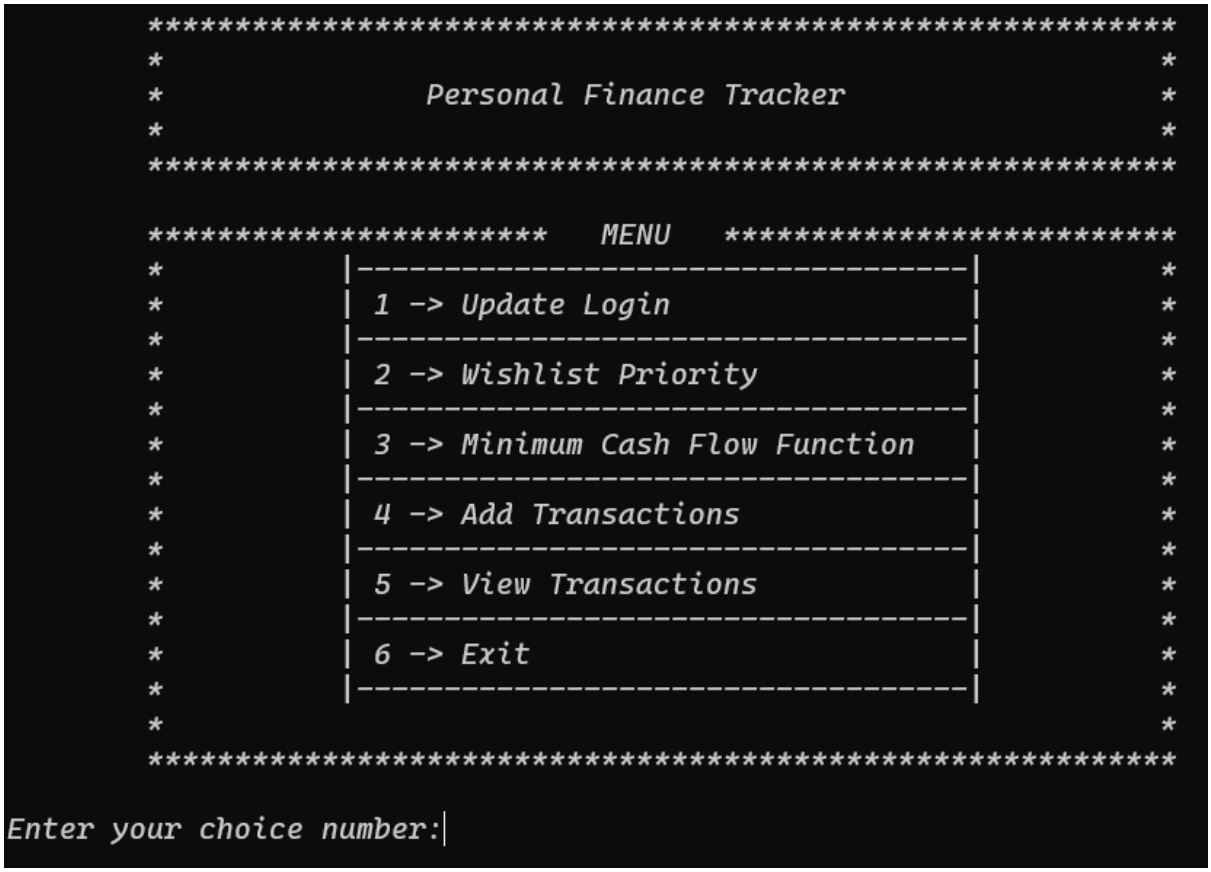
Note:

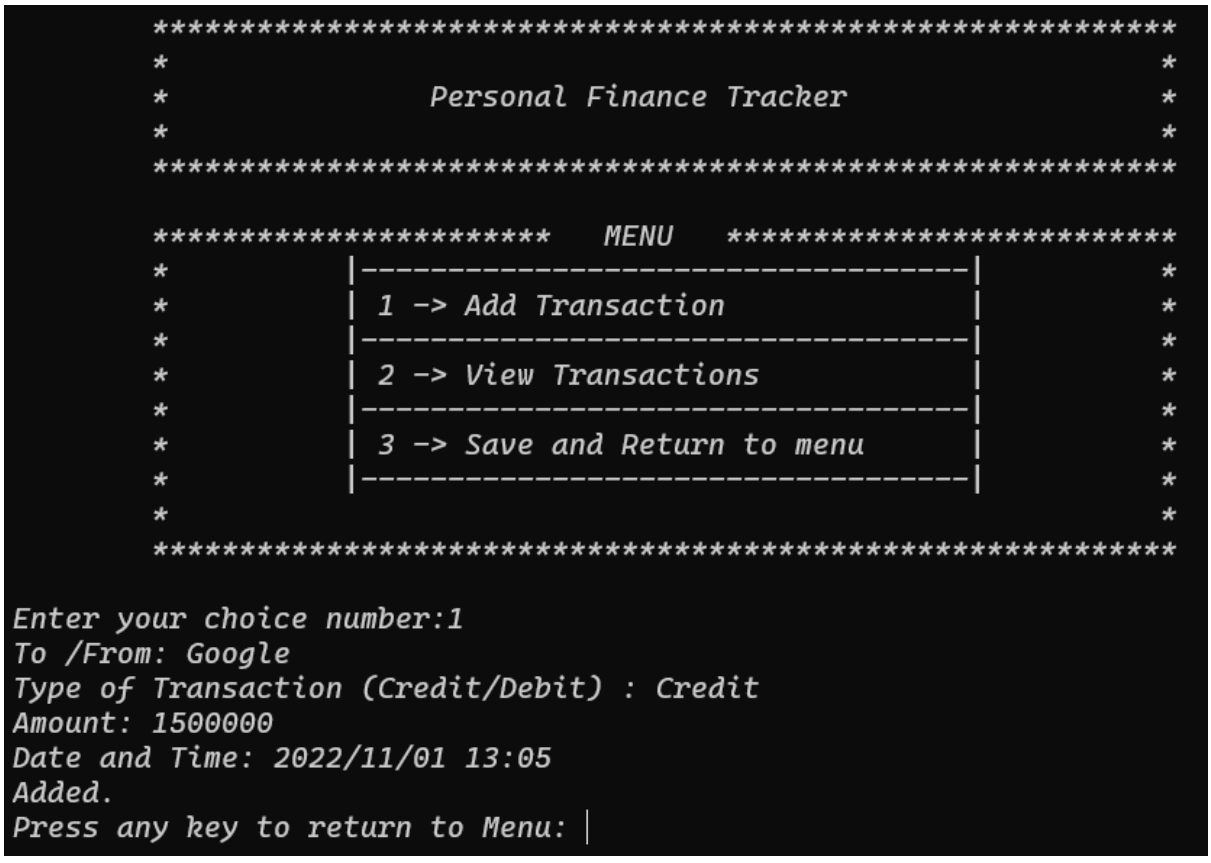
"This program will create two additional files in the same directory as the code. They will NOT be removed automatically as they are to be used during later executions of code too. These files are "Bookings.csv" and "LoginData.txt". Please manually remove these files if no longer needed".

Output:

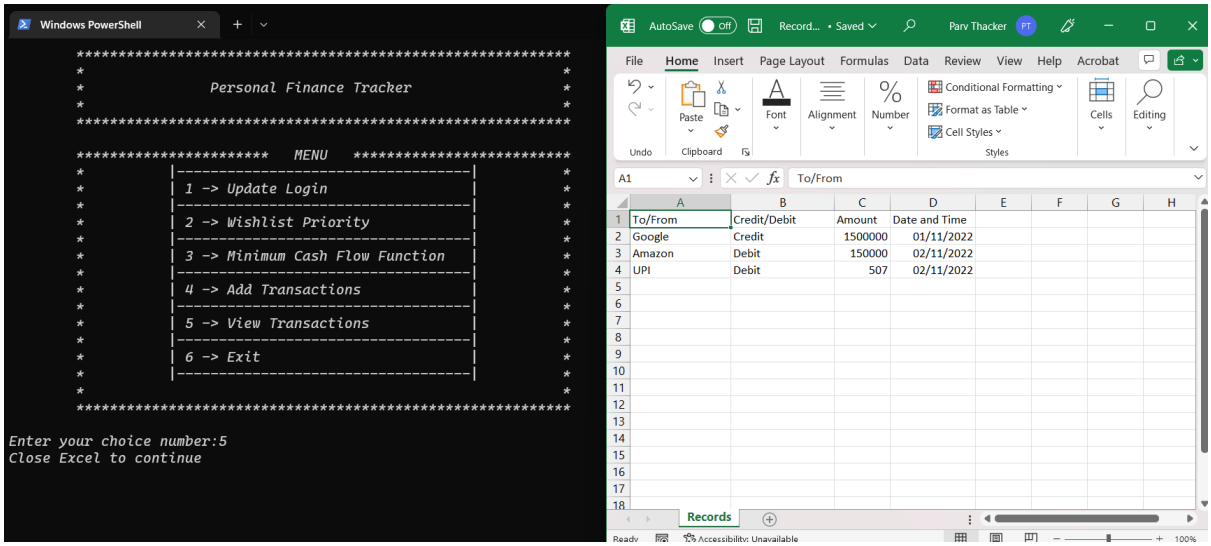
1. **Login and transection records:**




Personal Finance Tracker
MENU
1 -> Update Login
2 -> Wishlist Priority
3 -> Minimum Cash Flow Function
4 -> Add Transactions
5 -> View Transactions
6 -> Exit
Enter your choice number:


Personal Finance Tracker
MENU
1 -> Add Transaction
2 -> View Transactions
3 -> Save and Return to menu
Enter your choice number:1
To /From: Google
Type of Transaction (Credit/Debit) : Credit
Amount: 1500000
Date and Time: 2022/11/01 13:05
Added.
Press any key to return to Menu:

```
Enter your choice number:2
To/From                                  Credit/Debit    Amount          Date and Time
Google                                   Credit          1500000         2022/11/01
Amazon                                   Debit           150000          2022/11/02
UPI                                      Debit           507             2022/11/02
Press any key to return to Menu:
```



2. Set priority function:

```
Enter your choice number:2
Enter number of your wishes: 5
Select from the following  : [food , cloth , donate , car , bike , mobile ,tour ]
Enter your no.1 wish: car
Enter your no.2 wish: cloth
Enter your no.3 wish: food
Enter your no.4 wish: mobile
Enter your no.5 wish: donate
Your best choice as per priority: food
Your best choice as per priority: cloth
Your best choice as per priority: mobile
Your best choice as per priority: car
Your best choice as per priority: donate
```

3. **Minimum cash flow function :**

```
Enter the number of members in CashFlow --> 4
Enter the name of Member 1 --> dhruv
Enter the name of Member 2 --> jenil
Enter the name of Member 3 --> parv
Enter the name of Member 4 --> vinit
Enter the Number of Amount that dhruv has to pay to jenil --> 250
Enter the Number of Amount that dhruv has to pay to parv --> 150
Enter the Number of Amount that dhruv has to pay to vinit --> 350
Enter the Number of Amount that jenil has to pay to dhruv --> 150
Enter the Number of Amount that jenil has to pay to parv --> 260
Enter the Number of Amount that jenil has to pay to vinit --> 100
Enter the Number of Amount that parv has to pay to dhruv --> 140
Enter the Number of Amount that parv has to pay to jenil --> 60
Enter the Number of Amount that parv has to pay to vinit --> 50
Enter the Number of Amount that vinit has to pay to dhruv --> 125
Enter the Number of Amount that vinit has to pay to jenil --> 225
Enter the Number of Amount that vinit has to pay to parv --> 150
dhruv pays 310 to parv
dhruv pays 25 to jenil
```