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Project Proposal

Project Description

Hamster Fund is a money management application where you can record and keep track of your expenses, make budgeting plans, and gain customized financial analysis through graphs and ratings. With this application, users will be able to make better financial decisions and improve their spending habits.

Competitive Analysis

There are many existing money management applications online. Take the application "Monny" which I am using as an example, the parts which my project will be similar to it include the features of recording and keeping track of expenses, and generating charts based on user's expenses. On the other hand, my project will be unique since it can come up with a customized buying plan and a rating on the user's spending habit.

Structural Plan

The finalized project will be organized in one file with multiple modes, including welcoming screen mode, selection screen mode, record mode, budget mode, make budgeting plan mode, analysis mode, and rating mode. The main three sections which will show up on the selection screen are record, budget, and analysis, which all contain different functions as listed below:

	Modes contained	Main functions Included
1. Record	None	Record regular expenses, emergency expenses, and income. Users can enter new input and review spending records from the past.
2. Budget	Make budgeting plan mode	1. Savings Envelope for emergencies. 2. Users can make budgeting lists and rank them with different priorities. 3. Users can gain the best spending plan through the backtracking feature.
3. Analysis	Rating mode	1. Generate graphs (bar/pie charts) which display the user's expenses grouped by month and categories. 2. Provide a rating on the user's spending habits based on real-world data.

Algorithmic Plan

The most algorithmically complex part in my project is to implement a backtracking algorithm to come up with the best plan to maximize the amount of things with higher priorities you buy.

To do this, I will first divide the user's monthly income into three parts based on the 50/30/20 rule. In the backtracking algorithm, I will set two buckets for "needs" and "wants" with a maximum possible sum for each generated by the rule. Next, I can try adding items starting from the first priority to the bucket, and see what combination of spendings can be the closest to the maximum value in each bucket while containing items with higher priorities.

Timeline Plan

Major Features	04/25 - 04/26	04/27 - 04/28	04/29 - 04/30	05/01	05/04
Budgeting Algoritm Pt.1 - list of things the user plans to buy with different priorities and a time frame the user wants to buy those things in.	In progress	TBD		Done	
Budgeting Algoritm Pt.2 - preserve X amount for emergencies daily	Done			Done	
Budgeting Algoritm Pt.3 - backtracking		Start	TBD	Done	

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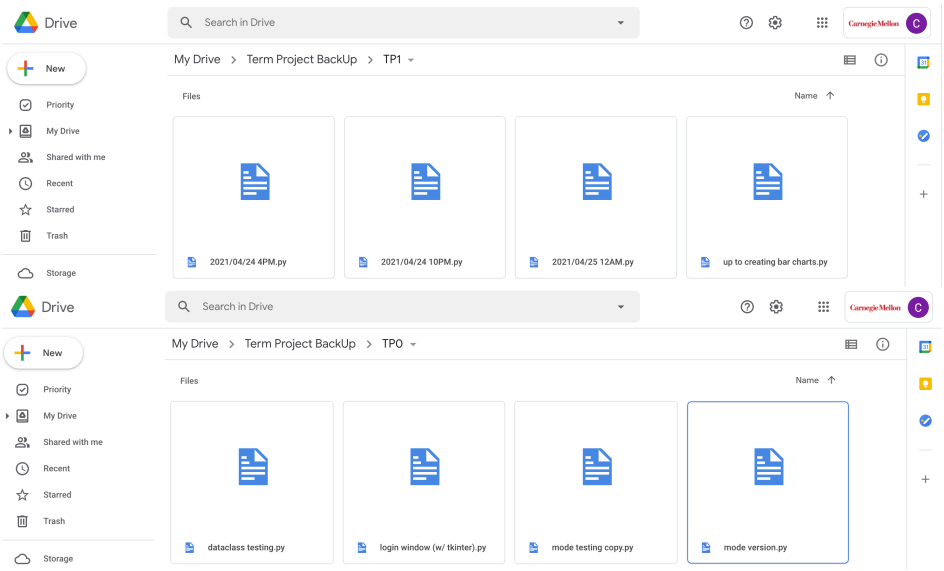
Financial Data Visualization Pt.1 - bar charts + list of data	Done			Done	
Financial Data Visualization Pt.2 - pie charts + list of data	In progress			Done	
Rating of Spending based on real data source		Start		Done	
Data storage in JSON files				Start	Done

Version Control Plan

I back up my code by storing two to three versions every day on Google Drive. After uploading new versions, I will delete some of the files that were uploaded before.



Module List

No additional modules or hardware are used in my term project.

TP2 Update

There are no changes in algorithmic design or application features and functions since TP1.

TP3 Update

- The functions in the record mode now includes entering income.
- The user's inputs, including expenses, income, emergency expenses, budget plans, and savings rate, are now stored in json files and will not be changed when the application is closed.