1. Introduction

1.1 Overview:

This project showcases the implementation of an expense tracker which allows users to set a budget for a particular month following which they would be able to add any expenditures. If the user's expenditures were to cross the budget set for that month, then an email would be sent in order to alert them. Also, users can get an analysis of their expenditure in a graphical form.

1.2 Purpose:

Money has always been a factor for stress in peoples lives. I believe that through this project, that worry could be alleviated by providing the user a straight forward, user friendly method of managing one's expenses. With a function of easily setting a budget. For when the user crosses the budget, an email alert is sent out to his email thereby informing that he has crossed his budget for that particular month following which the user could cut down on his expenses from there on end.

2. Literature Survey

2.1 Existing Problem:

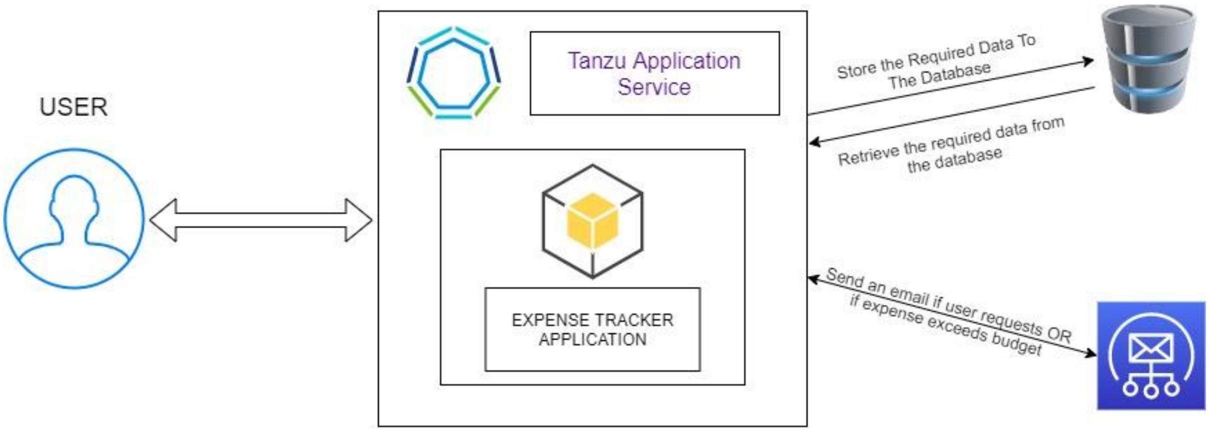
Several apps out here though they provided a good implementation of generating a good report of the user's expenses, there was a lack of visual aid which could have helped the user to understand where/when his finances are being consumed, that in turn could have helped the user to manage his finances in a streamlined manner.

2.2 Proposed Solution:

The solution is to provide a user- friendly application, that could make the process of managing one's expenses in an easier and effective manner by providing insightful charts that will help the user to derive useful data from it and understand where his finances are being consumed, which could in turn help him to manage his finances in a more coherent manner.

3. Theoretical Analysis:

3.1 Block Diagram:


USER
Tanzu Application Service
EXPENSE TRACKER APPLICATION
Store the Required Data To The Database
Retrieve the required data from the database
Send an email if user requests OR if expense exceeds budget

3.2 Hardware/Software Designing:

1. If code were to be pulled from GitHub, the requirements are:
   - Python 3.4
   - MySQL
   - Pip to install the required dependencies that are listed in the requirements.txt file.
   - SendGrid API Key which must be stored in a .env file

2. If app is directly run from the Tanzu Application service then there wouldn't be any software requirements since the docker image that was pushed to the Tanzu Application Service already contains all the required dependencies.

4. Experimental Investigations:

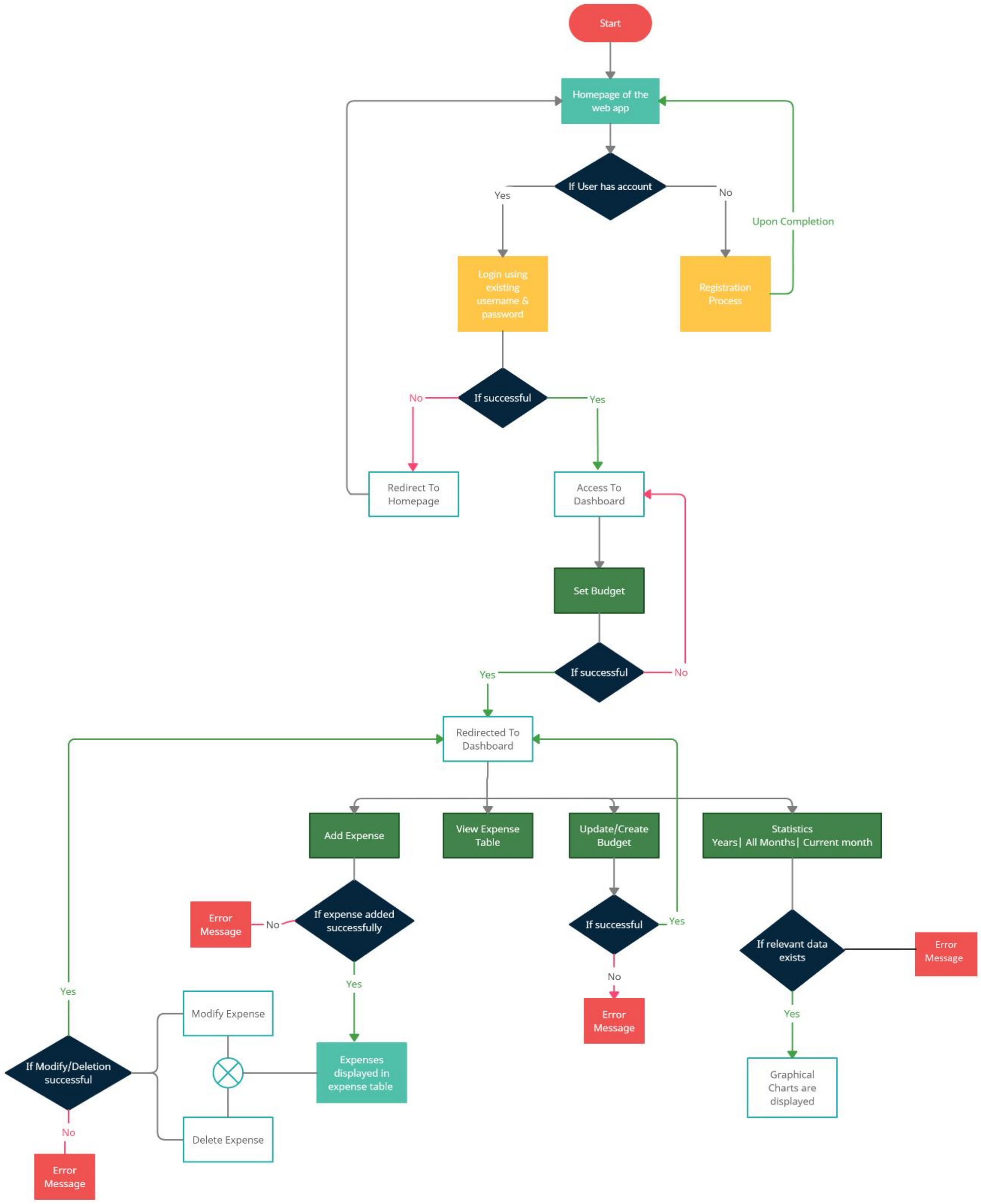
Picking the right template/theme is a crucial task since it is only through that can the user navigate through the site so a simple & comfortable one must be designed. Obtaining the right template and framing the basic layout was a tedious task which required analysis of choosing the layout that would be user-friendly and can be commonly followed through all the pages of the application. Once the layout was set, a basic structure was formed.

Following which was the implementation aspect of the application, wherein I had looked through several sites that have a transaction management service to see how they worked and how they were designed. Following an extensive research at how several other apps where expenses management was implemented, gave me the chance to rework on what I've looked through and develop my own ideas for my app.

Following the initial implementation came the edge cases which constantly broke the application which required me to constantly analyse the current code and reframe it or look through sites like stackoverflow.com for solutions regarding various errors that I've incurred.

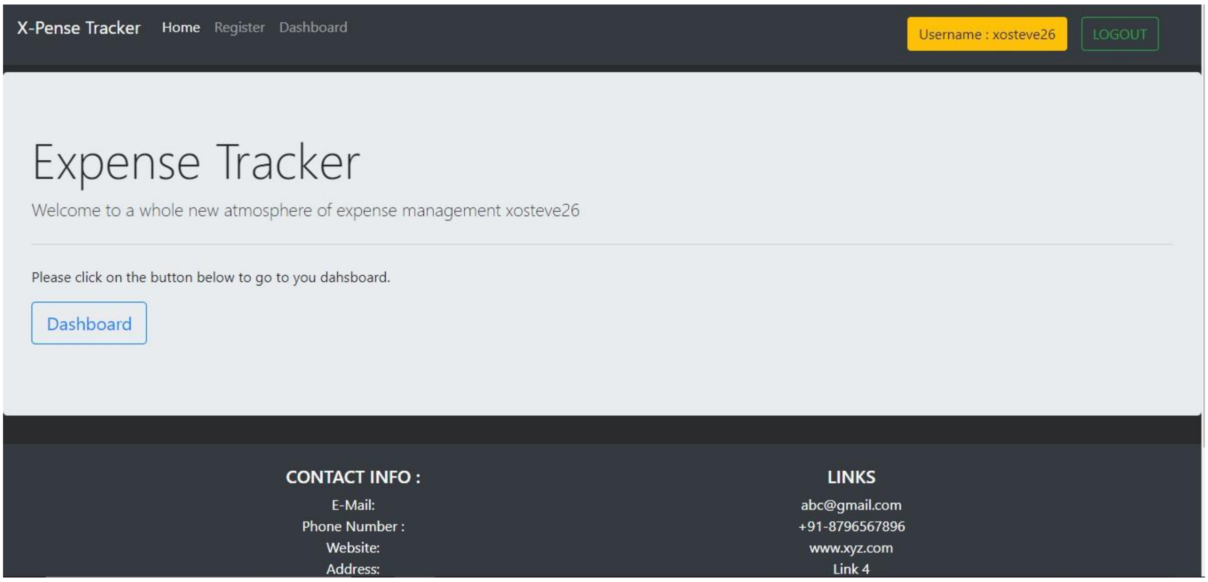
Sites like stackoverflow.com/flask documentation/YouTube tutorials Helped me to learn new concepts and overcome any errors that came my way. Even though the process isn't an easy one, it was nevertheless it was an interesting and a knowledge grabbing one.

5. Flowchart


Start
Homepage of the web app
If User has account
Yes
No
Upon Completion
Login using existing username & password
Registration Process
No
If successful
Yes
Redirect To Homepage
Access To Dashboard
Set Budget
Yes
If successful
No
Redirected To Dashboard
Add Expense
View Expense Table
Update/Create Budget
Statistics
Years| All Months| Current month
Error Message
No
If expense added successfully
If successful
Yes
If relevant data exists
Error Message
Yes
No
Error Message
Yes
Modify Expense
Yes
If Modify/Deletion successful
Expenses displayed in expense table
Graphical Charts are displayed
Delete Expense
No
Error Message

6. Result:

[Homepage]



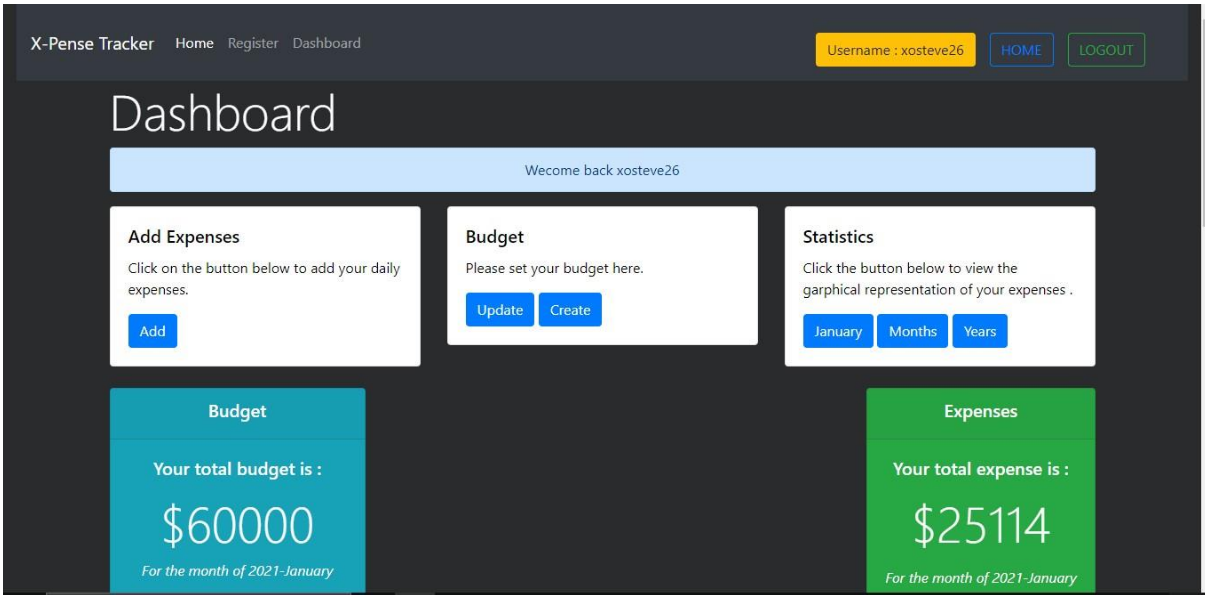
Expense Tracker

Welcome to a whole new atmosphere of expense management xosteve26

Please click on the button below to go to you dahsboard.

CONTACT INFO :	LINKS
E-Mail:	abc@gmail.com
Phone Number :	+91-8796567896
Website:	www.xyz.com
Address:	Link 4

[Upper section of Dashboard: Displays budget and total expenses for selected month]



Dashboard

Wecome back xosteve26

Add Expenses

Click on the button below to add your daily expenses.

Budget

Please set your budget here.

Statistics

Click the button below to view the garphical representation of your expenses .

Budget

Your total budget is :

$60000

For the month of 2021-January

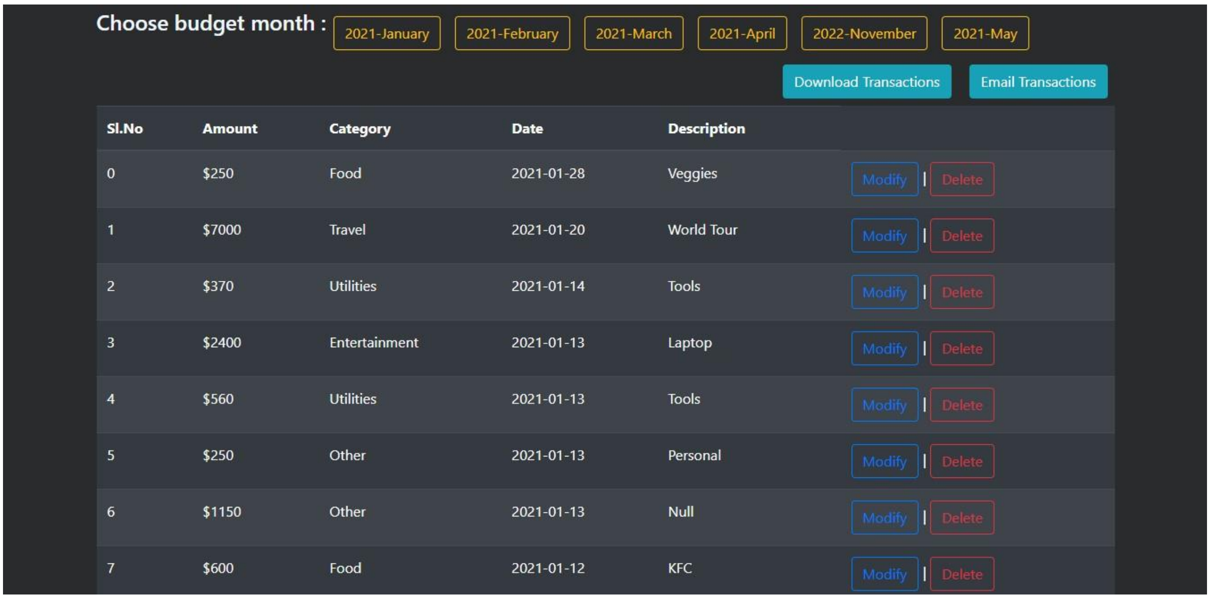
Expenses

Your total expense is :

$25114

For the month of 2021-January

[Lower Section of dashboard: displays the list of expenses]

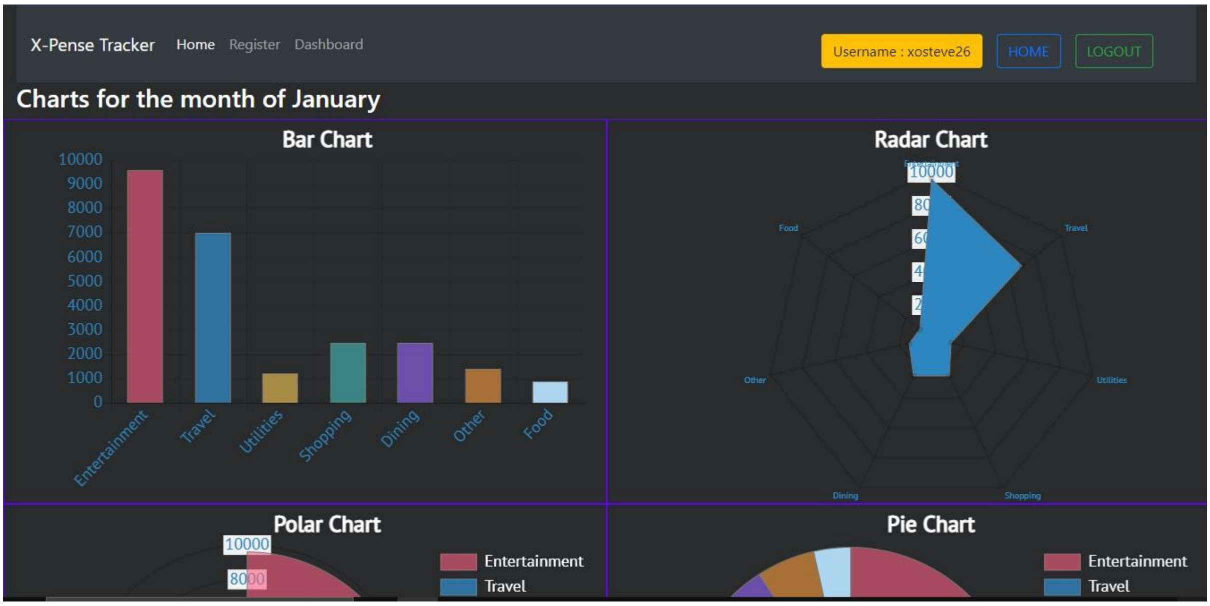


Choose budget month : 2021-January 2021-February 2021-March 2021-April 2022-November 2021-May

Download Transactions Email Transactions

Sl.No	Amount	Category	Date	Description	
0	$250	Food	2021-01-28	Veggies	Modify | Delete
1	$7000	Travel	2021-01-20	World Tour	Modify | Delete
2	$370	Utilities	2021-01-14	Tools	Modify | Delete
3	$2400	Entertainment	2021-01-13	Laptop	Modify | Delete
4	$560	Utilities	2021-01-13	Tools	Modify | Delete
5	$250	Other	2021-01-13	Personal	Modify | Delete
6	$1150	Other	2021-01-13	Null	Modify | Delete
7	$600	Food	2021-01-12	KFC	Modify | Delete

[Statistics Page for selected month: Displays charts of the expenses for the chosen month] (Section-1)

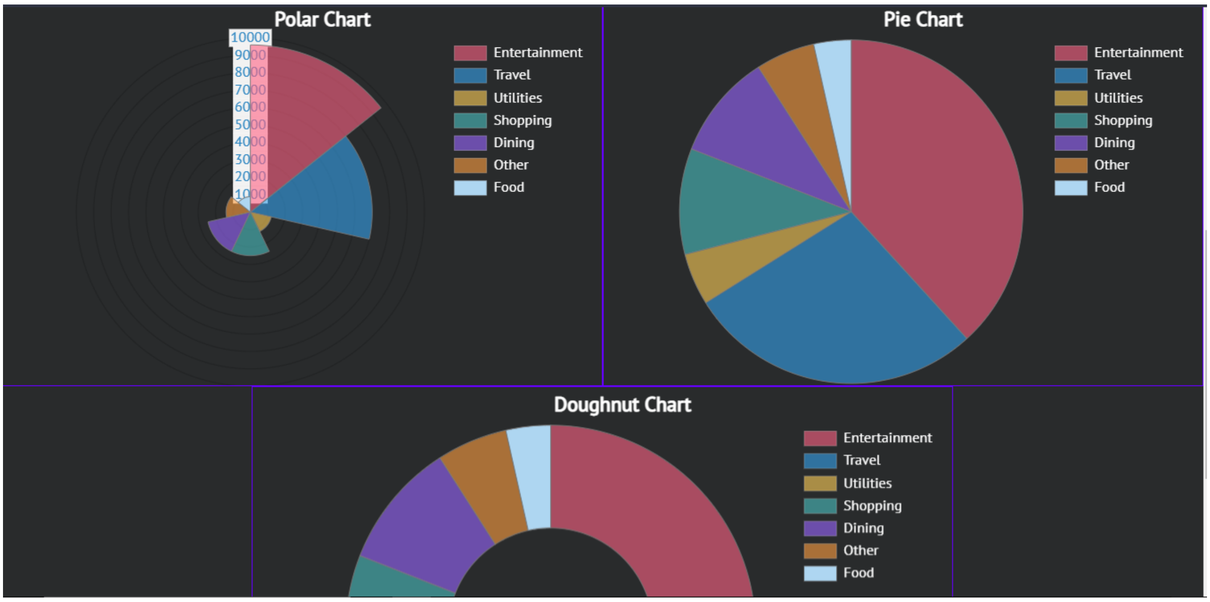


X-Pense Tracker Home Register Dashboard

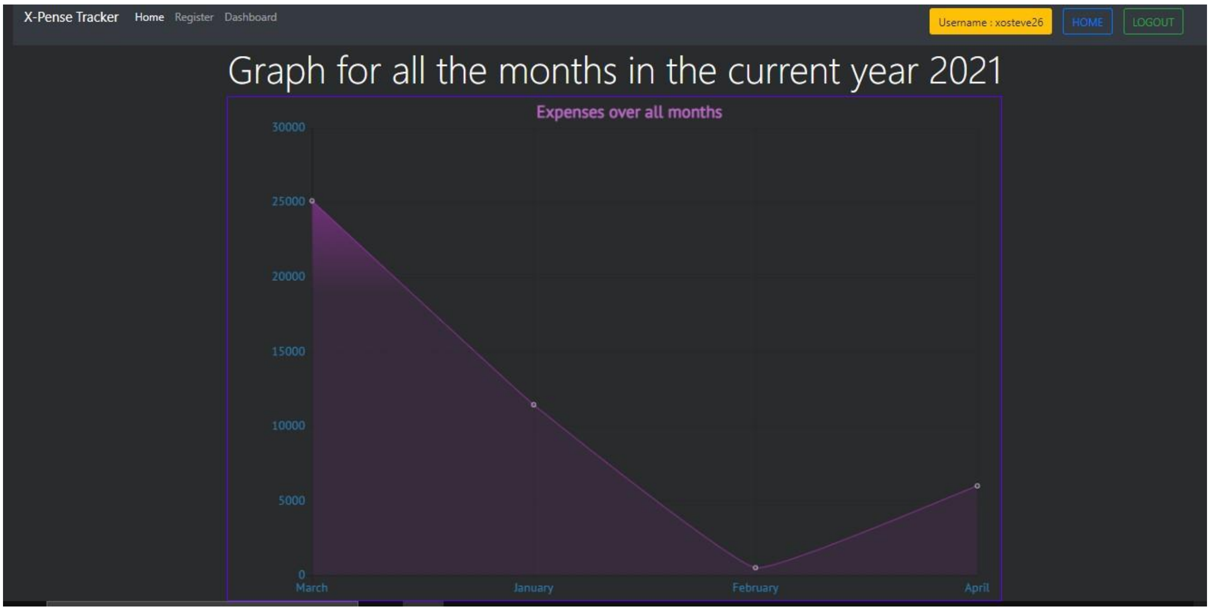
Username : xosteve26 HOME LOGOUT

Charts for the month of January

(Secction-2)



[Statistics Page for consolidated months: which displays a graph for the total expenses for each month]



Graph for all the months in the current year 2021

7. Advantages & Disadvantages:

Advantages:

- Provides the user with an option to set the budget for any number of months/years and choose between them
- Data visualization for the user based on current month chosen/ consolidated months/ consolidated years.
- Sends out an email alert to the user's email for when his expenses cross the set budget limit.
- Updating/Deleting of expenses and budget is available.

Disadvantages:

- The application might not be able to handle high loads of data inputs due the implementation of an online remote database.
- The UI is not a very aesthetically pleasing for these modern times.

8. Applications:

This application can be used by an end-user for his/her personal use or if we look at a much broader scope, this app could be integrated with the banking sector since most banking web apps have a page for maintaining a report of their users' transactions, its plausible that this app could be integrated by making minor tweaks like replacing the budget into a credit limit.

9. Conclusion:

In conclusion I would like to say that working on this project was very educational and gave me a hands-on experience with new technologies such as Flask, Docker, through which a functional application was built. Even though this application is functional, it is only to a certain extent, even though testing was done to a certain degree, there still could be a possibility of hidden edge cases will could cause the application to break. But based on the tests that I've done, the application has most certainly functioned as expected.

10.Future Scope:

Just like all products out there in the world, there are flaws and there is always room for improvement. With respect to this application, the UI could be modernised to make it more aesthetically pleasing, a more powerful & robust database could be attached to the app that can store the data of high volumes of user.

11.Bibliography:

a. https://stackoverflow.com/
b. https://flask.palletsprojects.com/_/downloads/en/1.1.x/pdf/
c. https://www.chartjs.org/docs/latest/
d. https://www.w3schools.com/python/python_mysql_getstarted.asp

Appendix:

https://github.com/smartinternz02/SPS-9691-Personal-Expense-Tracker