Forestview Technologies

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## Why Our Team Should Be Chosen:

* Our team here at Forestview Technologies should be chosen for this contract due to our efficiency in fulfilling the client's needs. Not only did we finish the project before the estimated date, but we also did it in the most efficient and cost-friendly manner. Before starting the project, we first figured out the requirements and what guidelines we wanted to follow along with development. Once we figured out the requirements, we started to focus on the system design and how to match it to the guidelines we created in our first collaboration meeting, we wanted the theme of our website to match what our program does so we decided upon a Consultant company which will specialize in custom software deliveries! Once we figured out our front end, we thought of a useful application that would match the requirements and design of our company, and we ended up with a monthly tracker that would visualize trends in data. Now the implementation phase has begun, we wanted to meet the requirements of the client to a tee while also being super-efficient, and to do this we had to make sure the runtime of our program was as close to O (1), constant as we could get it. We first did a rough draft of our application not worrying about the time complexity, but once we finished this we finetuned the code to where every functionality was between O(n) and O (log n), but eventually got it down to O(1) as this project did not require any looping just collecting the data given by the user. The operation that reduced our time complexity was separating the bar and line graph components to where they were just function calls in our code. Once our implementation was done, we moved on to the testing phase where we made sure each functionality worked independently of the other without interrupting the main program. We moved on to the deployment phase where we interconnected our user interface tkinter window and our turtle and tested them once again to see if there were no mishaps between displaying all the expenses of the user and the trend in data. Our last phase was maintenance where we did one last debug of our program and fixed functionality where the program would exit after finishing one operation as well as added more functionality for checking if input did not include foreign characters when added, or if input didn't match the year-month-day format we explicitly stated. This concluded our project as from the start we had chosen to use the waterfall paradigm similar to project 1 in our software development cycle, the sequential steps in the waterfall model made the project much simpler to understand and implement for the client. Our ability to deduce what software methodology we would need for the client's needs is also a part of the reason our contract should be fulfilled.

## Tools We Used:

* VS code
* Python w/ Tkinter library
* HTML & CSS
* JavaScript
* OneDrive
* Pylint
* GitHub
* Py Installer
* All code required for the main program itself was done using VS code in the Python language. We utilized some basic Python libraries like OS and CSV for the reading and writing to the spreadsheets, but we also used the Tkinter library to make a GUI for our program. This included making frames, buttons, pop-up messages, and taking inputs. After the program was done, we used Pylint to analyze our code for errors, coding standards, and code smells.  
    
  We again used VS code for the website to write the CSS in HTML. We utilized Boot Strapper 5 to help us with a template, then changed everything to fit our needs. As with most websites, we have included images and such in our front-end folder as well as secondary HTML pages that our main page links to. We used a bit of JavaScript to apply logic to things such as the user agreement checkbox, but it was used sparingly. The project one page also contains a link that leads to a OneDrive containing our .py and .csv files so users can download it to their systems.   
  Finally, all our collaborations were done using GitHub. We have a repository for our project, and forks for the three different sections of front-end, back-end, and code compliance. This allowed us to coordinate our changes effectively while minimizing merger conflicts. The forks meant that we could have each other check our work before pulling to the main to prevent errors from going through without notice.  
  We also utilized Py Installer to convert our code in at an easily runnable .exe file. This allows anyone on a typical computer system to run the program without having to compile it using an IDE.

## Desired Need & Fulfillment:

* Forestview Technologies is the optimal choice to fulfill the desired needs outlined in the contract. The team's commitment to efficiency is exemplified by the successful completion of the project ahead of schedule, ensuring both cost-effectiveness and timely delivery. Through a meticulous analysis of requirements, we developed clear guidelines and a system design, aligning the website theme with the software's functionality to meet the client's vision. In response to the desired need for an innovative application, our team crafted a wholesaling application for product inventory, showcasing adaptability and creative problem-solving. The implementation phase prioritized achieving optimal time complexity, with each functionality fine-tuned to ensure efficiency. Rigorous testing, a seamless deployment process, and detailed maintenance, including final debugging and additional functionalities, demonstrated our commitment to delivering a reliable product. Our strategic use of the waterfall model in the software development cycle, coupled with an adaptive approach to choosing methodologies based on client needs, underscores our ability to provide a structured and client-tailored solution. Utilizing a suite of tools, including VS Code, Python with Tkinter, HTML, CSS, JavaScript, OneDrive, Pylint, and GitHub, facilitated effective collaboration and version control. In conclusion, Forestview Technologies not only meets but surpasses the desired needs outlined in the contract, offering a comprehensive and detail-oriented approach to ensure the project's success.

## Team Collaboration:

Within the collaborative framework of Forestview Technologies, each team member brings unique expertise, contributing to the success of the project:

Talha Ali and Soham Bhavsar - Application Coding:

- Talha Ali and Soham Bhavsar have played instrumental roles in the application coding phase, leveraging their programming skills and creativity to develop a robust and innovative wholesaling application. Their collaborative efforts ensured the efficient implementation of functionalities, optimizing time complexity and meeting project specifications.

Maher Harkati and Mohammed Hoque - Frontend Development:

- Maher Harkati and Mohammed Hoque took charge of the frontend development, bringing their design and user interface expertise to the project. Their collaborative efforts resulted in a visually appealing and user-friendly Consultant company-themed website. Their contributions extended to logic implementation using JavaScript, ensuring a seamless and engaging user experience.

Amran Rahim - Coding Compliance:

- Amran Rahim took on the crucial responsibility of coding compliance, utilizing tools like Pylint to conduct code analysis. His attention to detail ensured that the code adhered to industry standards, minimizing errors, and enhancing the overall quality of the project. Amran's contributions in coding compliance were pivotal in maintaining a high standard of code throughout the development process.

Together, the collaborative efforts of Talha, Soham, Maher, Mohammed, and Amran synergized seamlessly, showcasing the effectiveness of their teamwork. The team's collective skills in application coding, frontend development, and coding compliance harmonized to create a successful and comprehensive solution for the client.

## Hosting Quotes:

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## In exploring hosting solutions for our Personal Finance Tracker website, pricing considerations vary among different providers. Amazon Web Services (AWS) offers plans ranging from $15 - $40 per month, with the flexibility to scale based on traffic. Microsoft Azure provides options starting at $20 per month, featuring robust cloud services tailored to diverse needs. On the other hand, Bluehost, a user-friendly platform, starts at $8 per month, making it a budget-friendly alternative with solid performance.

## Future Recommendations:

## In contemplating the future of the Personal Finance Tracker, Forestview Technologies should consider a forward-thinking approach. Prioritize scalability through flexible cloud solutions, enhance security measures for data protection, and explore mobile responsiveness. Seamless integration with third-party services and a robust feedback mechanism for continuous user engagement are crucial. Implement industry-standard testing practices, potentially embrace DevOps methodologies, and ensure comprehensive documentation for smooth transitions. Stay abreast of technological advancements for potential stack improvements. Foster a sense of community around the application to encourage user participation and loyalty, contributing to sustained success in the dynamic market landscape.

## STEM principle applications:

In this project, we have come across multiple instances where we had to apply some math or science depending on the situation. The most common area we applied some math or science was using to figure out the spacing or things of that nature; whether it's on HTML or Python applications. Some of the coding may have required a bit of number crunching in the front or back end but it was not anything to major. The complexity of your program can determine how math and science based your project may be. If you have a very mythically driven program in Java/Python, then it will require more complex math driven coding. Overall, our project was not very heavy on math, but we did apply the necessary computer science skills to make our website and application proper.

## Technical Documentation:

## **Overview**

The Personal Finance Tracker is a Python program developed with Tkinter to provide a graphical user interface (GUI) for managing and tracking personal expenses. Users can add their daily expenses, categorize them, and visualize the data through charts.

## **Features**

1. **Add Expense:**
   * Collects date, amount, and category information through an input form.
   * Validates the input for correctness and completeness.
   * Appends the entered data to the expenses list.
   * Displays success or error messages based on the result.
2. **Draw Chart:**
   * Allows users to visualize their expenses through either a bar chart or a line graph.
   * Supports customization of the chart type.

## **Code Structure**

### **Functions**

1. add\_expense():
   * Collects input data from the GUI.
   * Validates input for correctness.
   * Appends data to the expenses list.
   * Clears the input fields and displays success or error messages.
2. draw\_chart():
   * Determines the chart type selected by the user.
   * Calls the respective chart-drawing function.
3. draw\_bar\_chart():
   * Generates a bar chart based on aggregated monthly expenses.
   * Uses Turtle graphics for visualization.
4. draw\_line\_graph():
   * Generates a line graph based on aggregated monthly expenses.
   * Uses Turtle graphics for visualization.

## **Usage**

1. Run the program.
2. Fill in the required information in the input form.
3. Click the "Add Expense" button to add the entered information to the expenses list.
4. Select the desired chart type from the dropdown.
5. Click the "Draw Chart" button to visualize expenses.

Note: The program validates inputs to ensure correctness and completeness. Error messages are displayed for invalid inputs.

## **Dependencies**

* The program relies on the Tkinter library for creating the GUI.
* Uses the Turtle graphics library for drawing charts.

## **Conclusion**

The Personal Finance Tracker offers a user-friendly interface for managing and visualizing personal expenses. With features like expense addition and customizable chart drawing, it provides a convenient tool for tracking financial activities.