

Software Engineering FYP-24-SE-A-04 Proposal: AI-Powered Financial Tracker for Expense Management and Salary Prediction

Problem Statement:

Many people struggle to effectively manage their monthly expenses based on their salary, leading to financial difficulties at the end of each month. Most individuals are unaware of how to align their spending habits with their income, making it challenging to maintain financial stability. This project aims to provide users with an intelligent solution to manage their expenses and also predict the ideal salary needed for future survival.

Key Observations and Gaps:

Existing financial tracking platforms offer basic expense monitoring but lack personalized suggestions and future salary predictions using AI. Below are some platforms available in this domain:

1. (<https://mint.intuit.com/>):

A popular financial management tool that tracks spending, budgeting, and credit score but does not provide personalized salary forecasts or AI-powered suggestions.

2. YNAB (You Need A Budget) (<https://www.youneedabudget.com/>):

Focuses on helping users budget their money but lacks AI features for future salary prediction and in-depth expense analysis.

3. PocketGuard (<https://pocketguard.com/>):

Helps users manage their spending but is limited in offering customized advice based on salary analysis.

Identified Gaps:

- Lack of AI-based suggestions on how users can adjust their monthly expenses according to salary.
- No existing solutions provide predictive insights into future salary requirements for financial stability.

The challenge we aim to address:

We aim to help users effectively manage their monthly expenses by using AI-driven analysis of their financial data. This includes providing personalized suggestions to reduce unnecessary expenditures and predict future salary benchmarks needed for better financial planning.

Proposed Solution:

Develop a web application that allows users to input their monthly expenses and income data. The app will use AI algorithms to:

- Analyze spending patterns and suggest how users can adjust their expenses according to their salary.
- Predict the ideal future salary required to meet the user's financial needs based on historical spending data and inflation trends.
- Provide a user-friendly dashboard with interactive charts and analytics to visualize financial health.

Key Features Include:

1. Expense Tracking:

Users can input details about their monthly expenses and salary.

2. AI-Based Suggestions:

The system will offer personalized tips to align monthly expenses with salary.

3. Future Salary Prediction:

AI models will predict the user's future salary requirements based on trends in their financial data.

4. Custom Alerts:

Notifications when the user's expenses are exceeding limits.

5. Budget Planning Tool:

Create a budget plan based on the user's income and expenses.

6. Interactive Dashboard:

Visualization of expenses and income using charts, graphs, and comparisons.

Technologies to Be Used:

Front-End:

Next.js, TypeScript, Tailwind CSS

Back-End:

FastAPI (Python)

Database:

PostgreSQL or MongoDB

AI Models:

Linear Regression:

- **Google Colab (Free):**
 - Google Colab provides a free environment for running Python-based machine learning models, including linear regression. You can use libraries like TensorFlow, scikit-learn, or any other Python library for building your linear regression models.
 - Free GPU and TPU access, although with limited resources.
 - No setup required – run your models directly in a Jupyter-like environment.
- **Azure Machine Learning Free Tier:**
 - Azure offers a limited free tier that provides a restricted amount of hours for training and testing models, including linear regression.
 - You can use scikit-learn and other open-source libraries for building linear regression models.

2. Random Forest:

- **Google Colab (Free):**
 - Like linear regression, you can use Google Colab to run Random Forest algorithms with scikit-learn or other libraries for free.
 - Ideal for small-scale training and experiments.
- **Kaggle Notebooks (Free):**
 - Kaggle offers free Jupyter notebooks with GPU and CPU options where you can run Random Forest models using libraries like scikit-learn. Kaggle also provides free datasets and kernels to experiment with.

3. K-Means Clustering:

- **Google Colab (Free):**
 - Use scikit-learn or TensorFlow's clustering functions to implement K-Means clustering within the free Colab environment.
- **Kaggle Notebooks (Free):**
 - Kaggle's free notebooks also allow you to implement K-Means clustering using popular libraries, along with free data storage and some community-contributed datasets for experimentation.

4. TensorFlow or PyTorch:

- **Google Colab (Free):**
 - Fully supports TensorFlow and PyTorch with free GPU/TPU access for training and deploying deep learning models.
 - Great for small-scale projects and testing neural networks without any cost.

- **Kaggle Notebooks (Free):**

- Kaggle also supports TensorFlow and PyTorch for free, with up to 30 hours of free GPU usage each week. You can deploy and test models easily in the free environment.

Expected Outcome:

- An intelligent web app that helps users manage their expenses more effectively by offering AI-driven suggestions.
- A system that predicts the user's future salary needs, helping them make better financial decisions for long-term stability.
- A user-friendly platform with easy-to-understand visualizations and real-time expense tracking.

Conclusion:

This project aims to fill the gap in existing financial management platforms by offering a smarter, AI-powered solution for expense tracking and salary prediction. The final product will enable users to align their spending with their income and plan for future financial growth, ultimately improving their overall financial well-being.