GIGABIT 1.0

NON-SPECIFIC TECHNOLOGY RISK CALCULATOR

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Our Team

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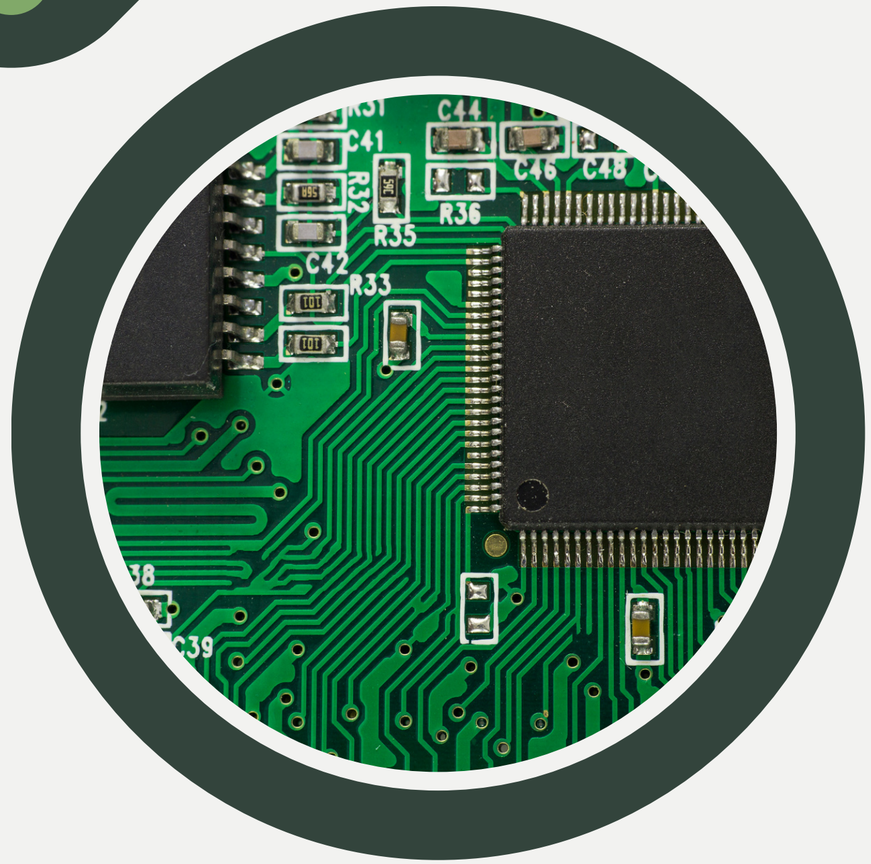
Our Research Topic

Detection of Energy Consumption and Performance of Third-party Applications using Machine Learning



Introduction to the Overall Project

Our team has created a Non-Specific Technology Risk Calculator which will detect performance issues and energy consumption of a third-party application/developing language before the installation/development stage.

Research Problem

- Any PC does not function well once an unknown third-party software is installed.
- Once the third-party program is installed, the PC becomes slow in performance and tasks.
- There can be risks to security and privacy issues coming from third-party applications.
- Lack of performance of device machines due to disk space or limited RAM capacity.

Our Main Objective

To implement a Non-Specific Technology Risk Calculator which will detect performance issues and energy consumption of a third-party application/developing language before the installation/development stage.

Our Sub-Objectives

DETECTION OF USER DEVICE SPECIFICATIONS

COMPARISON OF SPECIFICATIONS WITH THIRD-PARTY APPLICATION

INITIATION OF THE PERFORMANCE FRAMEWORK FOR DEVELOPERS

GENERATION OF PERFORMANCE REPORT WITH SUGGESTIONS

Risk Mitigation Report

NSTRC

Battery life: Collecting performance information could also have an impact on the device's battery life.	**Security risks:** Retrieving such information could also expose the device to potential security risks, as malicious apps could use it to carry out attacks or compromise the system.
Include clear and concise privacy policies and give users control over the information collected by allowing them to opt-in or opt-out of data collection.	**Implement secure coding practices and regularly perform security audits. Use encryption for sensitive data and regularly update the app to fix any security issues that are discovered.**

Risk Mitigation Report

NSTRC

Accuracy: The accuracy of the information displayed can also be an issue, as it may not always reflect the actual performance of the device.	**Compatibility**: The app should also be compatible with a wide range of devices and operating systems to ensure that the performance data can be obtained on all devices.
Perform regular tests to ensure that the data being displayed is accurate and up-to-date.	**Test the app on a wide range of devices and operating systems to ensure that it is compatible and functions correctly on all devices. Regularly update the app to support new devices and operating systems.**

Commercialization- Packages

GIGABIT 1.0
NON-SPECIFIC TECHNOLOGY RISK CALCULATOR

Free

Standard

- Mobile/Web Application functionalities.
- CPU and RAM Performance Check.
- App Suggestion Check.
- Security Analysis of Third-Party Application

LKR 490

Platinum

- All features in standard package.
- CPU and RAM Alert System.
- App suggestion and Performance Monitoring.
- In-Depth suggestions for PC/Browser Check

LKR 990

Developer

- Developer starter pack for code quality and syntax issues.
- VS Code Extension compatible with all OS.
- Simple bug tracking, maintenance index and language compatibility.

IT19189086 – Rahman S.H

Software Engineering

Research Problem

- Installing third-party software can slow down a PC and pose security and privacy risks.
- It may also cause stress due to reduced performance caused by disk space or limited RAM.
- There can be risks to security and privacy issues to malware and virus attacks coming from the third-party application.

Research Objectives

Main Objectives

Detection of the User Device and Third-Party Application Performance and Compatibility

Sub-Objectives

Allow the proposed system to run in the background before installation.

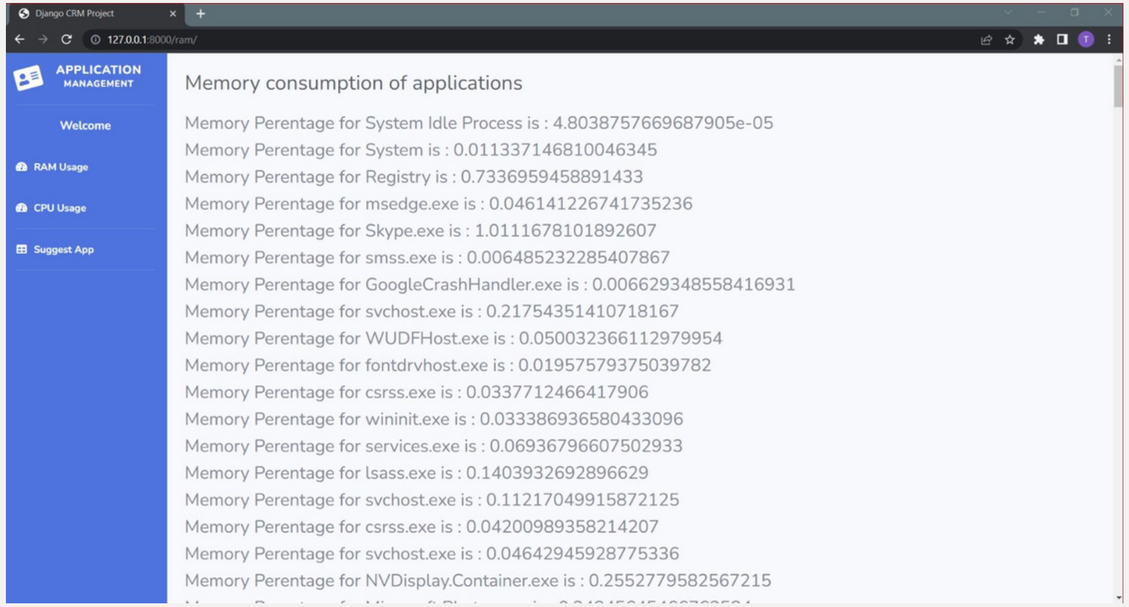
Carry out the detection of RAM and CPU usage and check for performance

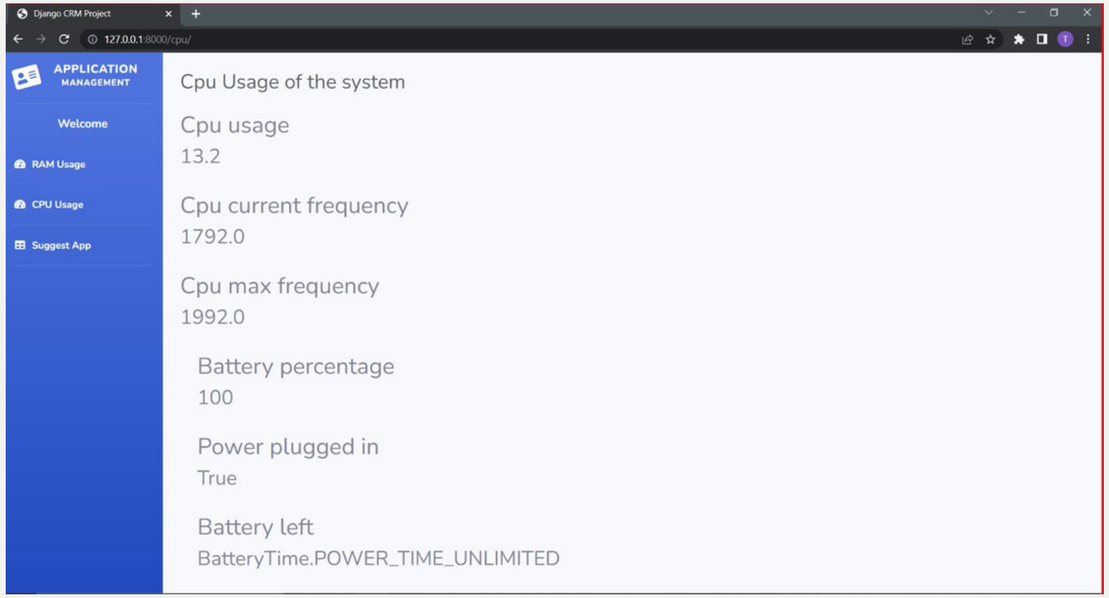
Display possible risks and performance errors on a security level basis.

Current Progress

- Detect and initiate the performance and compatibility test for CPU and RAM usage.
- Do a demonstration of the CPU and RAM usage with multiple background applications.
- Perform a security level-based checkup while being able to retrieve data and information from the third-party application using ML.

Project Evidence and Best Practices





Requirements

NSTRC

Functional requirements

1. SHOULD BE A FREE DOWNLOADABLE APPLICATION
2. DETECT THE DEVICE SPECIFICATIONS AND STORE THEM IN THE LOCAL DATABASE
3. GET INFORMATION ON THIRD-PARTY APP TO DETECT ANOMALIES.

Non-Functional Requirements

1. HIGH AVAILABILITY
2. EFFICIENCY OF PERFORMANCE
3. USER-FRIENDLINESS

IT19129440 – THIRANYA M.A.R.

Software Engineering

Research Problem

How to check the performance and energy consumption level of the user device and third-party applications and suggest what is the most suitable third-party application according to the performance of the user device in order to give an effective experience to the users.

Research Objectives

Main Objective

- Comparison of User device performance compatibility with the third-party application and suggest the most suitable third-party application.

Sub Objectives

- Comparison of the performance and energy consumption between third-party apps and user devices (mobile/PC).
- Display the comparison details.
- Suggest the most suitable third-party application according to the performance of the user's device.

Current Progress

- Collected a similar kind of software dataset required for the web application.
- Trained the dataset with the content base recommendation ML algorithm.
- Completed the Comparison of the performance and energy consumption between third-party apps and the PC.
- Display the processed comparison details.
- Completed the suggestion of the most suitable third-party application according to the performance of the user's device.

Objectives completion

Collected a similar kind of software dataset required for the web application.

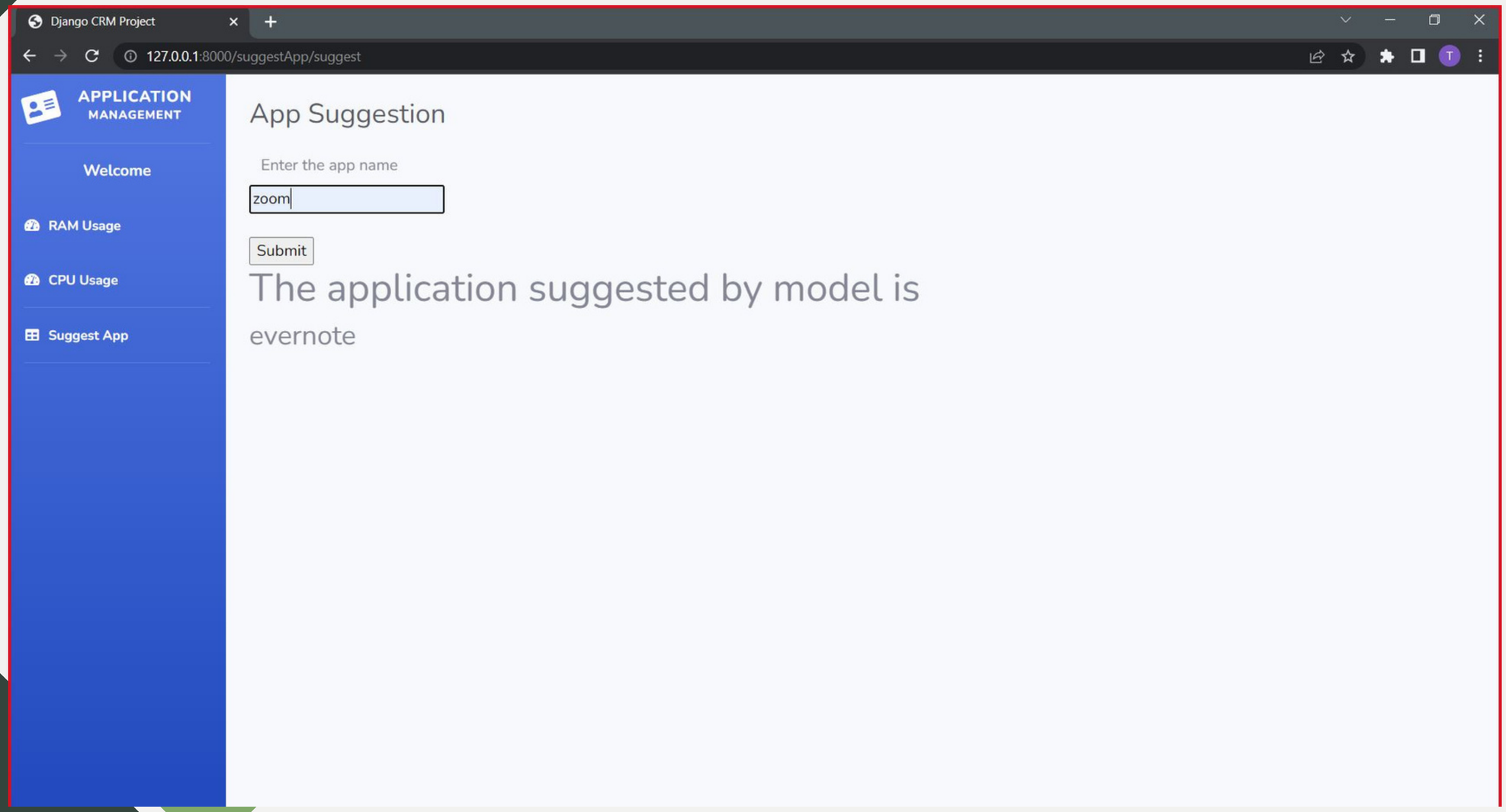
Completed the Comparison of the performance and energy consumption between third-party apps and the PC and display details.

Trained the dataset with the content base recommendation ML algorithm

Completed the suggestion of the most suitable third-party application according to the performance of the user's device.

Completed the frontend for the web aplication.

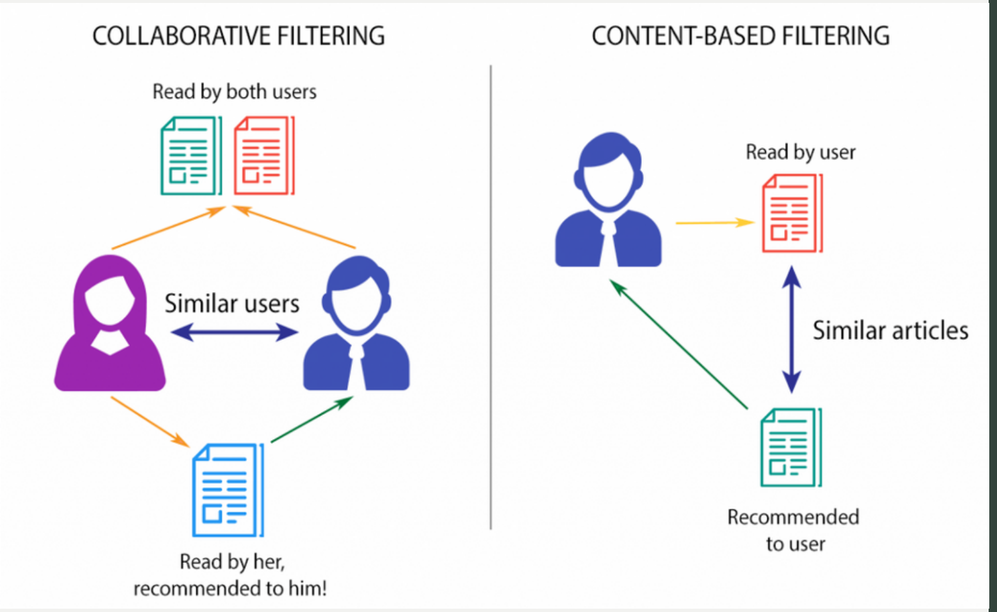
Project Evidence and Best Practices



Machine Learning Content

In dataset training part

- Suggest the most suitable third-party application
- Used machine learning algorithm - Content based recommendation
- Cosine similarity



In web application development part

- Django python-based framework is used with the Django REST framework to create the web API along with the jinger template with all the necessary libraries imported to the framework.

Next Expected Progress

- Collect a similar kind of mobile application dataset required for the mobile application.
- Train the dataset with the content base recommendation ML algorithm.
- Complete the Comparison of the performance and energy consumption between third-party apps and the mobile application.
- Display the processed comparison details.
- Complete the suggestion of the most suitable third-party application according to the performance of the mobile application.

Requirements

Functional requirements

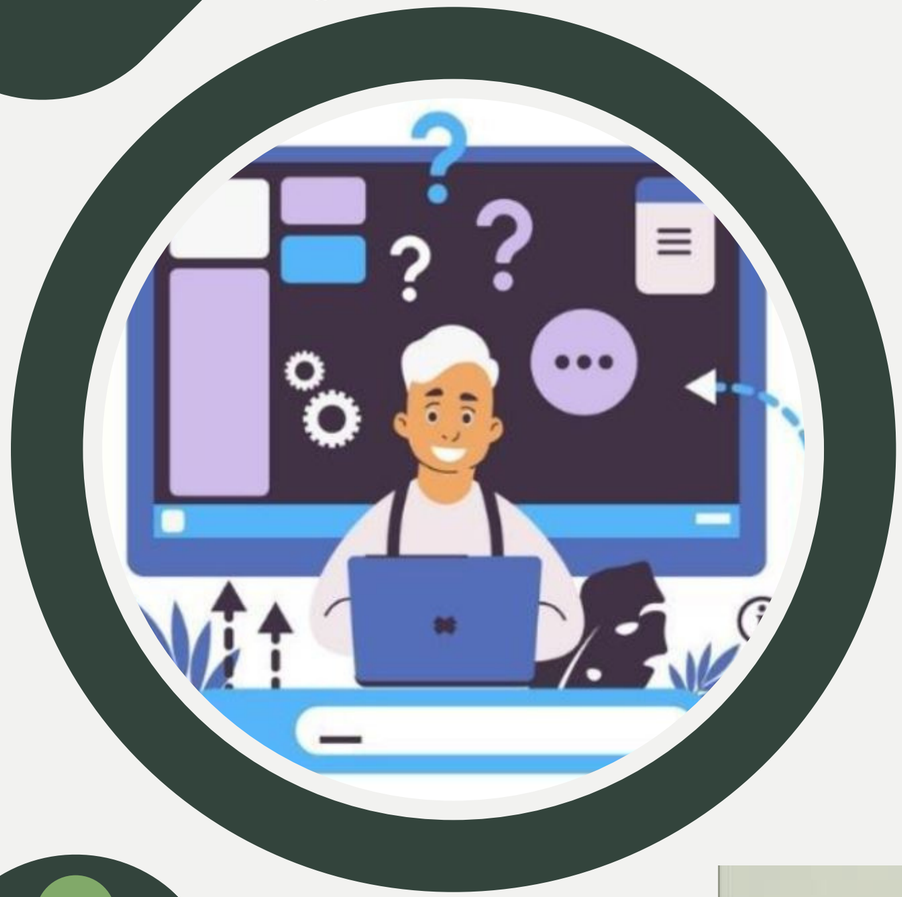
- Identified the user device performance level
- Identify the third-party application performance level
- Suggest the most suitable third-party application according to the performance level.

User requirements

- Compatible with any smart device
- The processing speed should be high
- Data should be Reliable
- User Friendliness

IT19048338 – JAYASINGHE H.M.C.P

Software Engineering



Research Problem

- Can every developer write quality code ?
- Is every working codes written with quality standards and better quality to manage the traffic?
- Does code quality and code maintainability affects the site performance?
- Does every developer know about the how to improve the site speed and how it be done?

Research Objectives

Main Objective

- Detection of the Developer’s code performance level, code quality level and speed level. Provide suggestions to improve the speed level and performance.

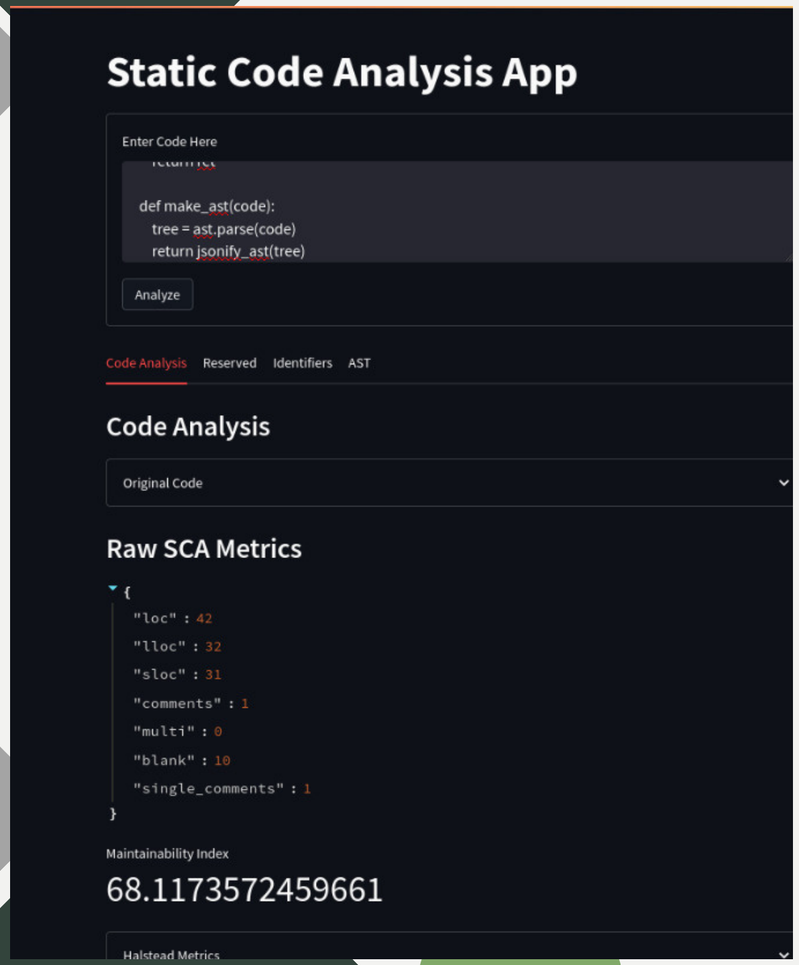
Sub Objectives

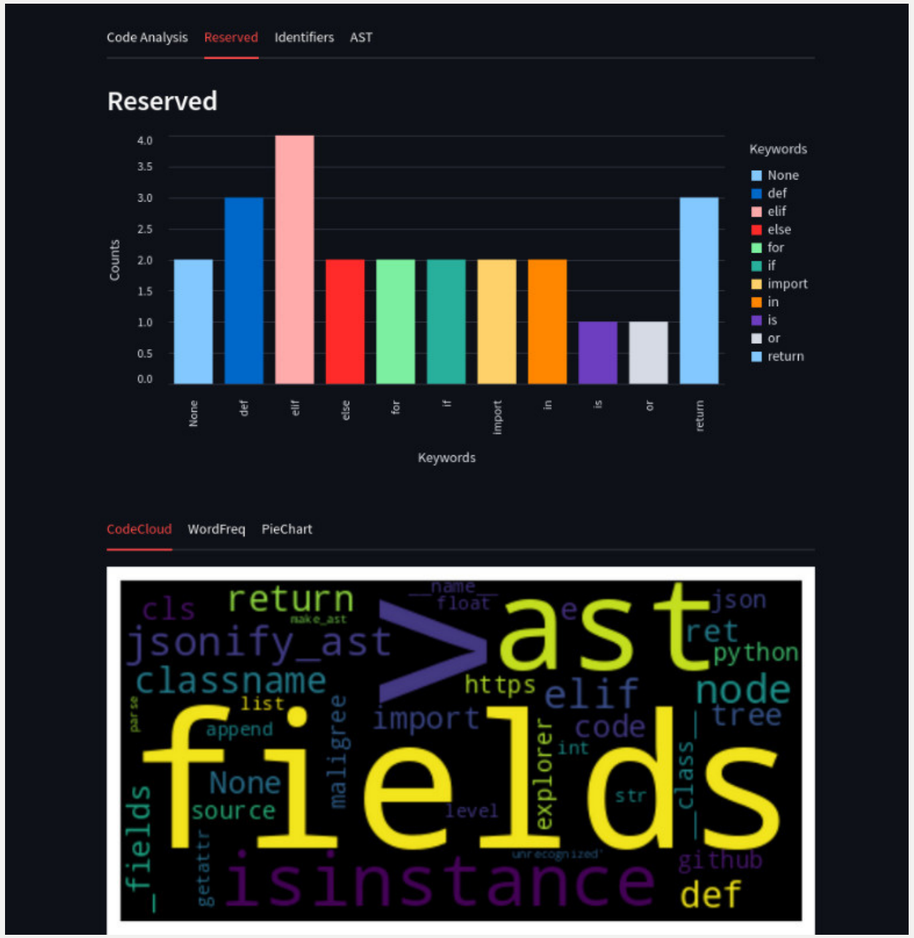
- Collect data set and find a better solution architecture.
- Develop a package to identify maintenance index, bug probability and code analysis metrics performance score.
- Develop a in house search engine for search performance improvements and code quality related things.
- Develop a tracking runtime performance tracker.
- Develop a desktop application with wrap all the developed components and generate reports and visualization.

Current Progress

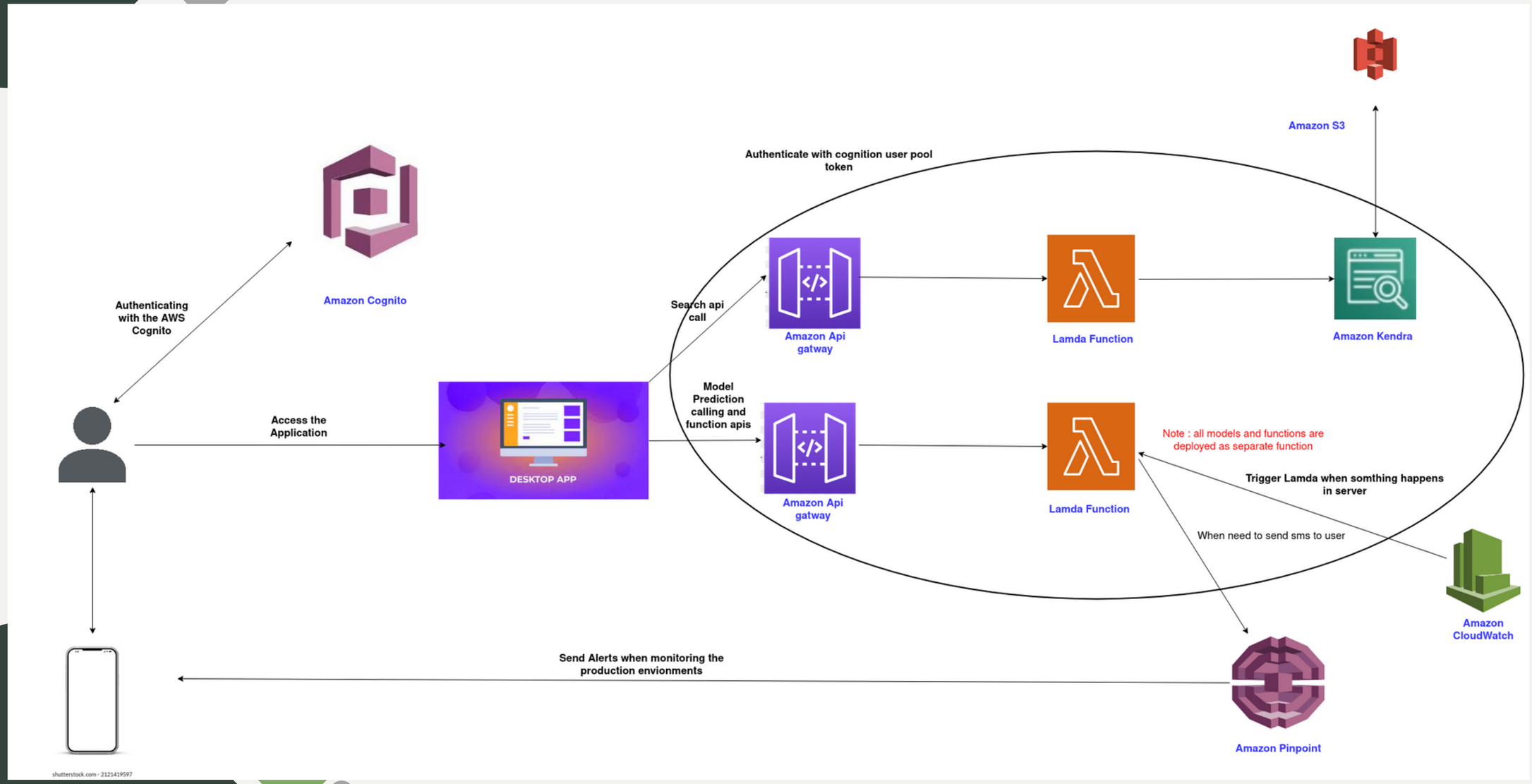
- Collect data set and find a better solution architecture. ✓
- Develop a package to identify maintenance index, bug probability and code analysis metrics performance score
- Develop a in house search engine for search performance improvements and code quality related things. ✓
- develop a tracking runtime performance tracker.
- develop a dekstop application with wrap all the developed components and generate reports and visualization.

Project Evidence and Best Practices





Solution arcitecture for the application



Next Expected Progress

- Develop a tracking runtime performance tracker.
- Develop an in house search engine for search performance improvements and code quality related things.
- Develop a desktop application with wrap all the developed components and generate reports and visualization with the proposed architecture.

Requirements

NSTRC

Functional requirements

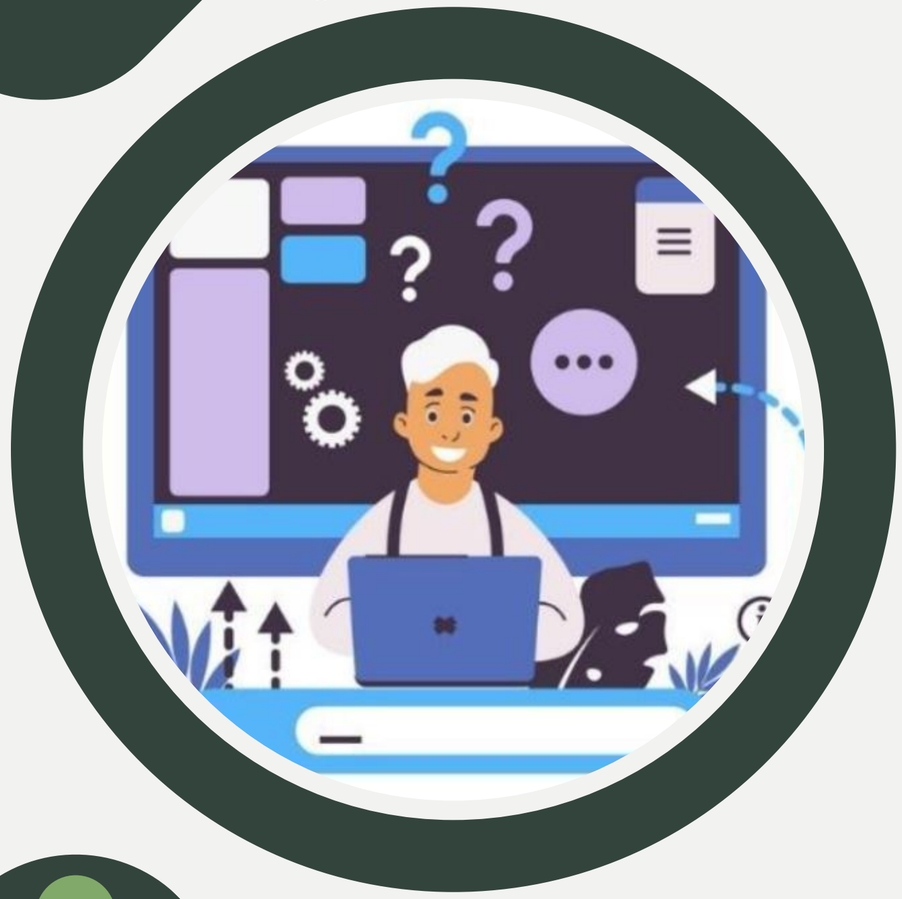
1. INSTALLABLE APPLICATION FROM THE WEB.
2. INSTALLABLE PACKAGE MANAGER FROM THE WEB.
3. GIVE SUGGESTIONS TO IMPROVE SITE SPEED BY USING SEARCH ENGINE
4. MONITORING THE PRODUCTION ENVIRONMENTS AND ANALITICS THE PERFORMANCE

Non-Functional Requirements

1. SHOULD BE COMPATIBLE WITH ANY OF THE OS.
2. ANALYZING SPEED SHOULD BE HIGH.
3. USER FRIENDLY GUI FOR TESTING TOOL.

IT19156316 – RAJAPAKSHA R.M.

Software Engineering



Research Problem

- When developers have written a program/software component, they need to always test the performance level and problems.
- After testing and identifying performance problems and levels, majority of them cannot solve that problem soon.
- A developer don't have a proper way to implementing the solutions while identifying programming issues and performance fixes soon

Research Objectives

Main Objective

- Vs code Extension for Finding Real time syntax issues and Improvements with Voice Assistant and Graphical User Interfaces.
- Performance level of specific functionality using performance Metrics and Give the best suggestions to improve the performance.

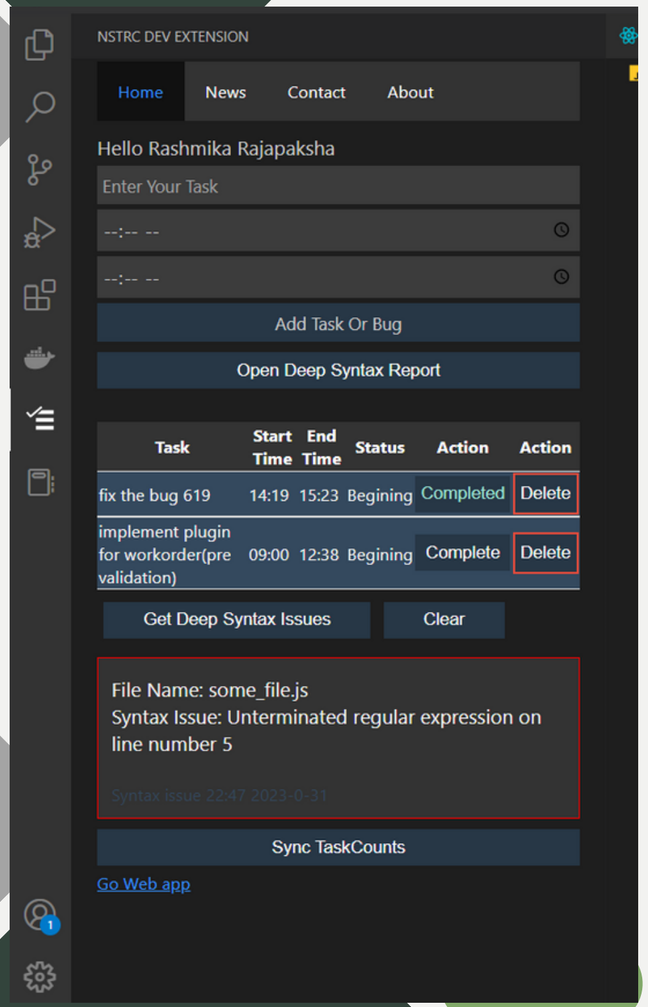
Sub Objectives

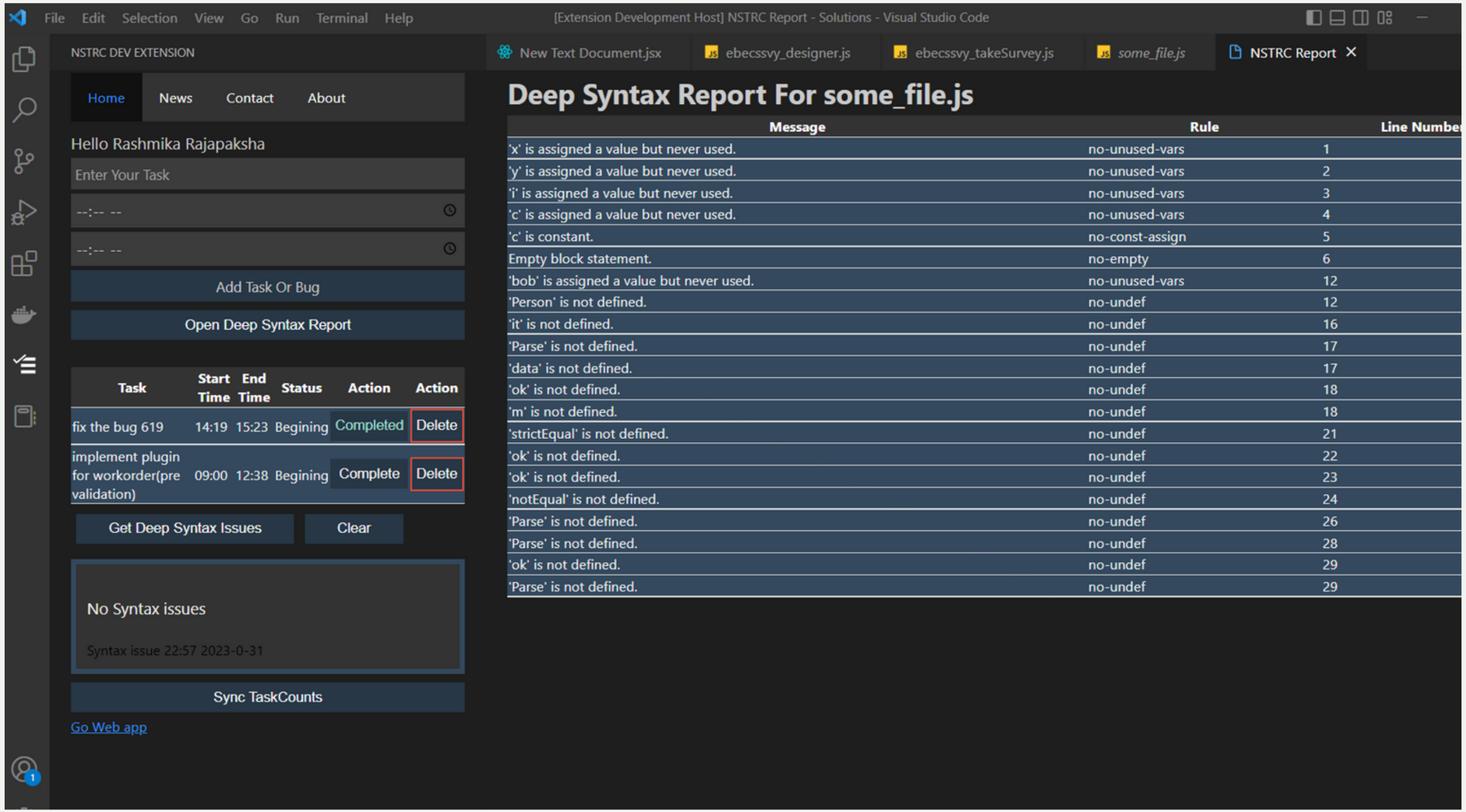
- Extension for finding syntax issues in developer friendly way with hearable voices while developer is coding.
- Identifying ESLint behaviors' to analyze deep syntax issues and improvements
- implement the daily task and bugs assigner in VScode extension with graphical user interfaces
- Generation report based on performance measurement.
- Collect dataset and model training for generating performance suggestions.
- Implement the web application with uses of Machine Learning Model.

Current Progress

- Extension for finding syntax issues in developer friend way with hearable voices while developer is coding. ✓
- Identifying ESLint behaviors' to analyse deep syntax issues ✓
- Implement the daily task and bugs assigner in VScode extension with graphical user interfaces ✓

Project Evidence and Best Practices





Next Expected Progress

- Development of web application to identify requests per minute and bytes per request, Security exposure, Average response time, Error rates, CPU and Memory usage, Latency and uptime of developing application and after using those details.
- Gives best suggestions to improve performance of that application.

Requirements

Functional requirements

- Identify Syntax mistakes (VS Code Extension)
- Identify Performance Improvements and runTime Mistakes.(VS Code Extension)
- Tasks and Bug assigner in Vs code Extension
- Identify Software performance Metrics in Ready to production web application(NSTRC Web application)
- Give Suggestion To Performance improvements(NSTRC Web application)

User requirements

- Can See Syntax Mistakes in Hearable and Visual Manner.
- Can add Multiple tasks and Bugs in a day(VS Code Extension)
- Can See The Performance Metrics values of web app using NSTRC Web application
- Can Get suggestions To Improve specific Performance Level(NSTRC Web applcation)

DEMO