**Introduction**

My project is a database application used to store student information, including their ID numbers, grades, and age. This program started as an idea for a much larger project that would help college instructors track students through social networking. However, after considering the bigger picture, I decided to focus on smaller, more manageable goals. This project is the starting point: building a database to store student information and their grades. For this assignment, no actual student data will be used.

**Requirements Analysis**

The project uses the following libraries:

* PySimpleGUI (third-party library): Provides a graphical user interface for user interaction.
* json (standard library): Used to save and load student information in a JSON file.
* System Architecture
* GradeBook Class: Manages student data, including adding, updating, deleting, and retrieving student records.
* GUI: Allows users to input and view student data. The GUI includes a title "Health Net Scholars," which will be part of a larger future project.
* Data Design

The data consists of information about students involved in an allied health program. The program will save and load student information using a JSON file. The student data includes:

* Student ID
* Student Name
* Class
* Grades (list of grades)
* User Interface Design

The user interface will present the visual and interactive aspects of the software. Below is a description of the UI layout:

Header: Displays the logo "Health Net Scholars."

**Main Window:**

* Input fields for Student ID, Student Name, and Class.
* Tabs for managing different aspects of student information:
* Student Management: Adding and deleting students.
* Grade Management: Adding and deleting grades.
* Grade Calculations: Getting and calculating student grades.
* Other Operations: Printing all students, searching for a student, and exporting data.
* A multi-line text box to display output and messages to the user.
* An enlarged Exit button for better visibility.

**Module/Component Design**

* PySimpleGUI: This provides the user interface in a user-friendly environment that is graphically pleasing. It features a large window to allow users to see the data as they input information. It uses methods based on user choices, like pressing a button to add a student or search.
* JSON: This is where the data is stored. It is saved in a file named ‘gradebook.json’. It loads data from previous uses, so the data remains available, and it saves the data every time it is updated or modified.

**Methods**

* load\_data: Loads student data from the JSON file.
* save\_data: Saves student data to the JSON file.
* add\_student: Adds a new student to the database.
* add\_grade: Adds a grade to a student.
* delete\_grade: Deletes a grade from a student.
* calculate\_final\_grade: Calculates the average grade for a student.
* get\_grades: Retrieves the grades for a student.
* print\_all\_students: Returns all student data.
* export\_data: Creates a file that contains saved data, and can be saved in a readable format, and viewed as a txt file.

**Implementation Plan**

The GradeBook class and its associated methods are fully functional. The user interface, built with PySimpleGUI, includes tabs for better organization of features and an enlarged Exit button for improved usability. I have succesfully made the json file work well, and now accurately saves data, and can be easily exported into a txt file. I feel like I have met the assignment criteria to the best of my knoledge and understanding. Below is a link where video demonstration can be viewed.

<https://youtu.be/rFYnIype-wM>