FUNDAMENTAL OF COMPUTER PROGRAMING
WITH C LANGUAGE

TITLE: FIRST SEMESTER PROJECT REPORT
TASK: STUDENT RECORD SYSTEM
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1. TASK DESCRIPTION

Student record system — This program performs CRUD(Create, Retrieve, Update and Delete) action on students and subjects in a class and calculate the average grades for these subjects.

2. PROJECT ANALYSIS

In order to do the given task, I create different functions that perform specific actions and when the user types in the command it calls the action. I persisted the students, subjects and grades data into a .csv file as a substitute to a database. I also use a singly linked list to store data while compiling the program before writing to file.

3. EXTERNAL SPECIFICATION

If it is your first time running the program, it will suggest you type the `help` command which will list all acceptable commands to use and navigate through the program.

The flow of the program is that you have to create students and subjects first. Then use edit grades to put a student's scores in different subjects. After filling in the grades, use the `CALCULATE_RESULT` command

The commands are not case sensitive, but make sure you typed it accurately. When you will be required to enter some data that is in the database, the program will print the database so that you can copy the student and subject ID correctly without mistake.

When you are anywhere inside the program that you are required to put a text/string command, you can use the `MAIN_MENU` command to return to the main menu.

Note: The `QUIT_PROGRAM` command closes the program but when you start it again you still have your previous data.
        The `RESET_PROGRAM` command deletes all the data stored in the database and starts everything afresh.

4. INTERNAL SPECIFICATION

The program is not a monolithic application, it is written in three files,
- main.c
- Functions.c
- Functions.h

The main.c file contains few lines of codes, it checks if the grades.csv files exists because this does not exist it means the program is being run for the first time. If it does not exist, it will show little instruction for the first timer. The file goes on and calls the mainMenu() function where it will give the user the option to enter and run commands.

The Functions.h file contains the header declarations, import of useful libraries, creating og Node struct and function prototypes of the program

The Functions.c files contain all the helper functions used in the program.

The program saves the csv data in a database folder in the same folder directory as the main.c file. Below is the project tree design
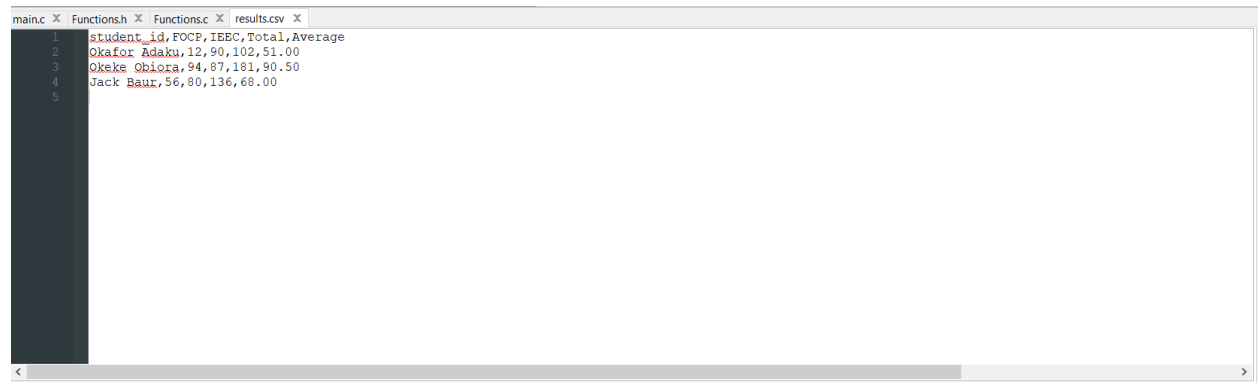
Command Prompt

```
C:\Users\Okpaleke Chukwudi>tree "C:\Users\Okpaleke Chukwudi\Documents\sem1_project" /f
Folder PATH listing
Volume serial number is 000000E1 A083:5C97
C:\USERS\OKPALEKE CHUKWUDI\DOCUMENTS\SEM1_PROJECT
    Functions.c
    Functions.h
    Functions.o
    main.c
    sem1_project.cbp
    sem1_project.depend
    sem1_project.layout

├──bin
│   └──Debug
│           sem1_project.exe

├──database
│       grades.csv
│       results.csv
│       students.csv
│       subjects.csv

└──obj
    └──Debug
            main.o


C:\Users\Okpaleke Chukwudi>_
```

5. TESTING

First running of the programme looks like this when you type `help` command:

"C:\Users\Okpaleke Chukwudi\Documents\sem1_project\bin\Debug\sem1_project.exe"

```
Please if this is the first time of running the program, type `INFO` to get the information about the program and usage
instruction.

Enter a new command, or type help for list of commands: help

New Command: HELP
Here are the list of commands:
MAIN_MENU        You can use this to go to program main menu
QUIT_PROGRAM     You can use this to quit the program
RESET_PROGRAM    You can use this to reset the program
CREATE_SUBJECT   You can use this to create new subject
CREATE_STUDENT   You can use this to create new student
EDIT_SUBJECT     You can use this to edit a subject
EDIT_STUDENT     You can use this to edit a student
EDIT_GRADE       You can use this to edit a grade
LIST_SUBJECT     You can use this to list a subject
LIST_STUDENT     You can use this to list a student
LIST_GRADE       You can use this to list a grade
DELETE_SUBJECT   You can use this to delete a subject
DELETE_STUDENT   You can use this to delete a student
CALCULATE_RESULT You can use this to calculate
INFO             You can use this to print the information about this program
This command does not exist, please type HELP to see the list of all available commands.

Enter a new command, or type help for list of commands:
```

The program creates a file results.csv after calculating the average of the students and store the results data there.

```
main.c ✕  Functions.h ✕  Functions.c ✕  results.csv ✕
  1   student_id,FOCP,IEEC,Total,Average
  2   Okafor Adaku,12,90,102,51.00
  3   Okeke Obiora,94,87,181,90.50
  4   Jack Baur,56,80,136,68.00
  5
```

6. CLOSING REMARKS

In my testing, the program works perfectly without any error or warning. Please contact me if there is any problem in setting up or running the program