TCP1101 Assignment

Trimester 1, 2020/2021

By HighLuck

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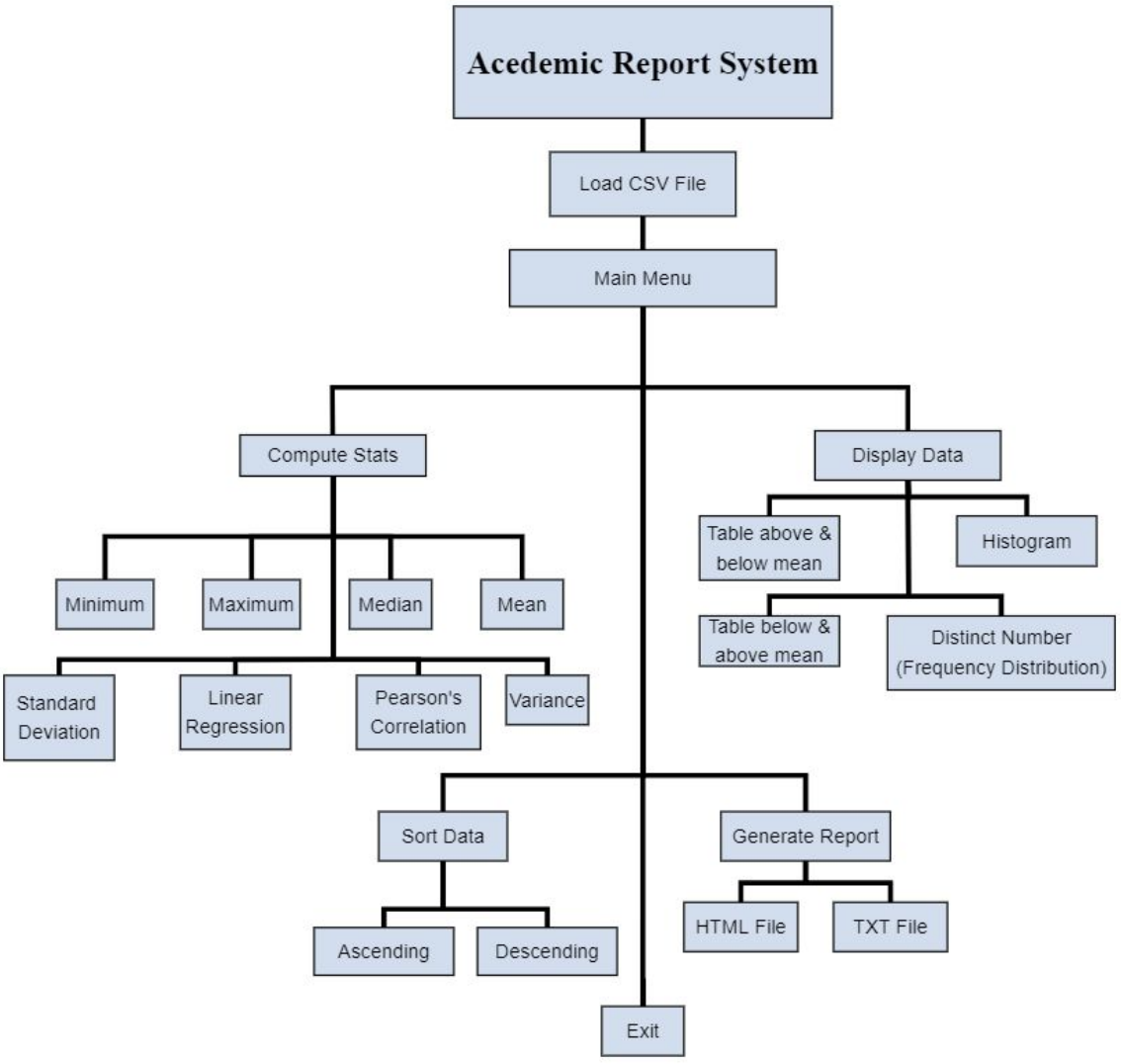
Function List

Lim Wei Jie	**Loo Chen Zhi**	**Tee Ming Yuan**	**Chang See Jie**
Data()	void print()	double Minimum(int columnNo)	void clrScr()
string HTML()	int GetColumn()	double Maximum(int columnNo)	void invalid()
void WriteHTML(string file_name)	void GetColumnTwo(int &c1, int &c2)	double Mean(int columnNo)	void correlationLinearMenu(Data *data)
void WriteFile(string fileName, Data *data)	void Histogram(int columnNo)	double Median(int columnNo)	void computeStatsMenu(Data *data)
void Correlation(int c1, int c2)	void AboveAndBelowMean(int columnNo)	double Variance(int columnNo)	void computationData(Data *data)
void LinearRegression(int c1, int c2)	Void exitProgram()	double StandardDeviation(int columnNo)	void sortMenu(Data *data)
void printData(int c)	void WriteFile(string fileName, Data *data)	void sort(int columnNo, bool reverse = false)	void mainMenu()
~Data()	void generateReportMenu(Data *data)	void Frequency(int columnNo)	
Data *readFile()			
int main()			
void TEXT(string fileName)			

Structured Chart



How to Compile Program

Make sure to download MinGW so that you will be able to compile the cpp program.

1. Compile using Command Prompt

Step 1: Download our beloved program in zip format.

Step 2: Extract the zip file into a folder.

Step 3: Open up the Command Prompt.

Step 4: Enter “cd” along with the location of the cpp file which you can find by right clicking the cpp file and click “Properties”.

Step 5: Type “g++ FileName.cpp -o FileName.exe” and press Enter.

Step 6: Type “FileName.exe” and press Enter

Instruction

1. Welcome Page

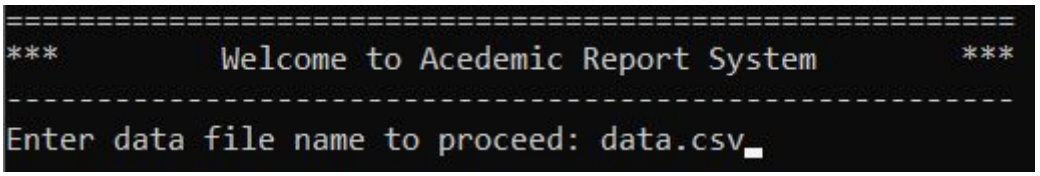


Figure 1.1

Prompt user to input CSV data file name in order to proceed to next step.

1.1. File name format

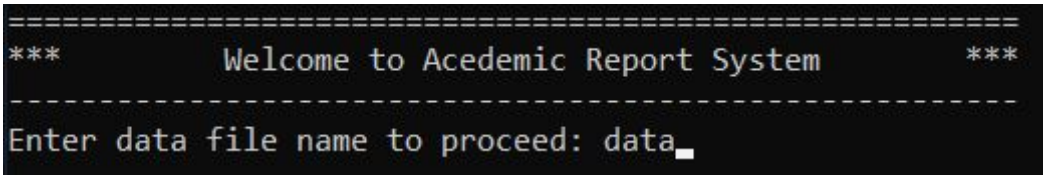


Figure 1.2

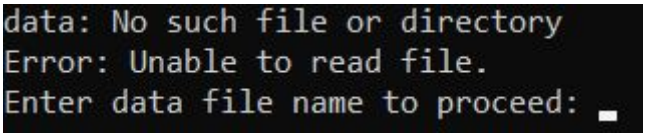


Figure 1.2.1

The data file name input must be in .csv format, if not the program will show error message and prompt user to input a valid file name.

2. Main Menu

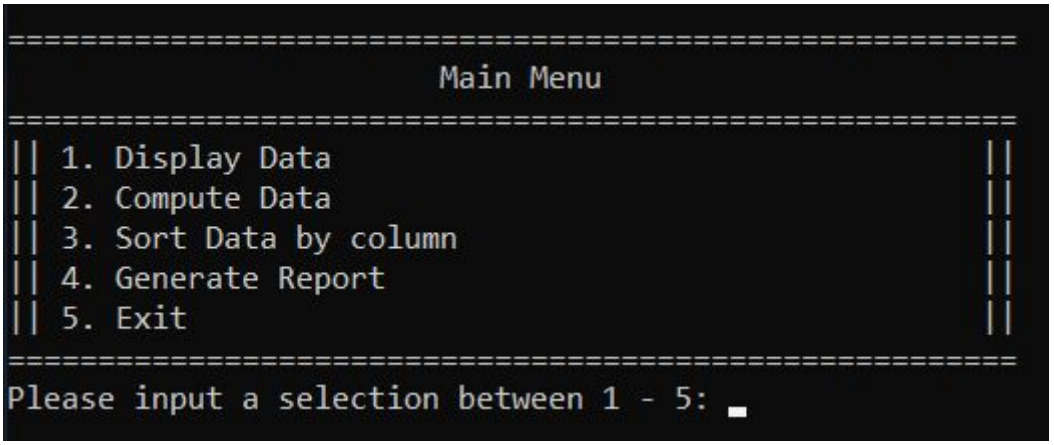


Figure 2.1

After successful import CSV file, the program will bring the user to the main menu page (Figure 2.1). This page prompt user to input an option between 1 to 6, different option will lead to different function.

2.1. Option 1: Display Data

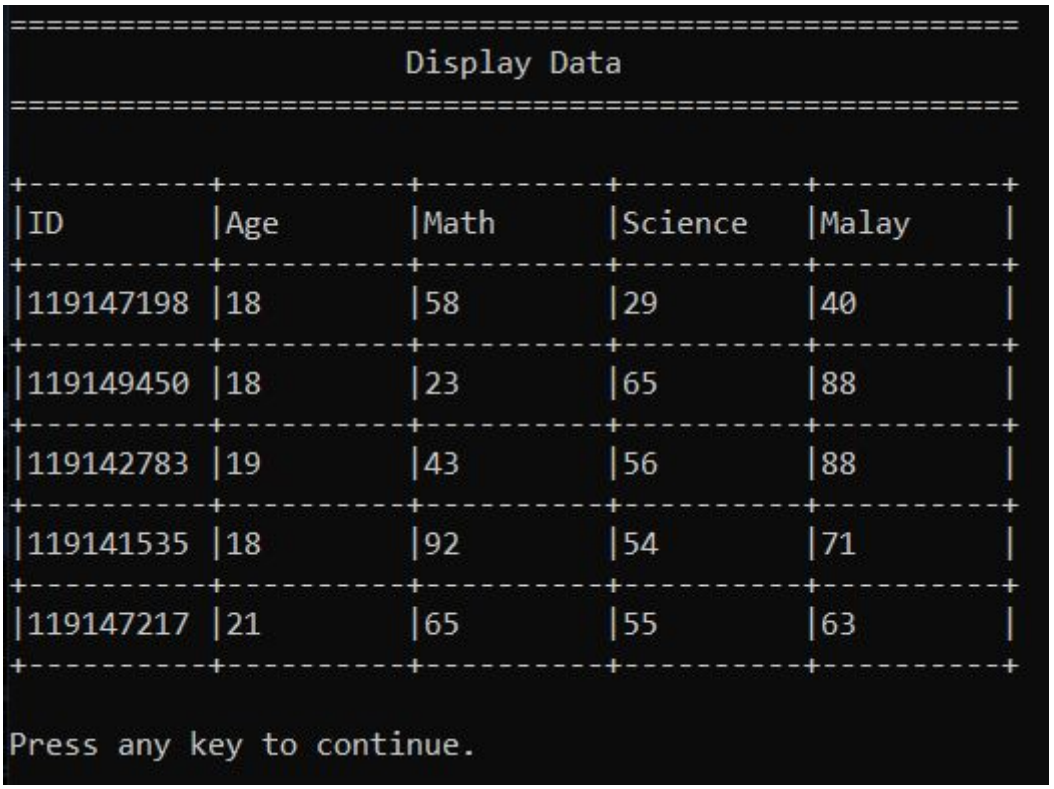


Figure 2.2

Option 1 will print out all the data in CSV file in tabular form without any change. Then, press any key will bring the user back to the main menu page (Figure 2.1).

2.2. Option 2: Computation Data

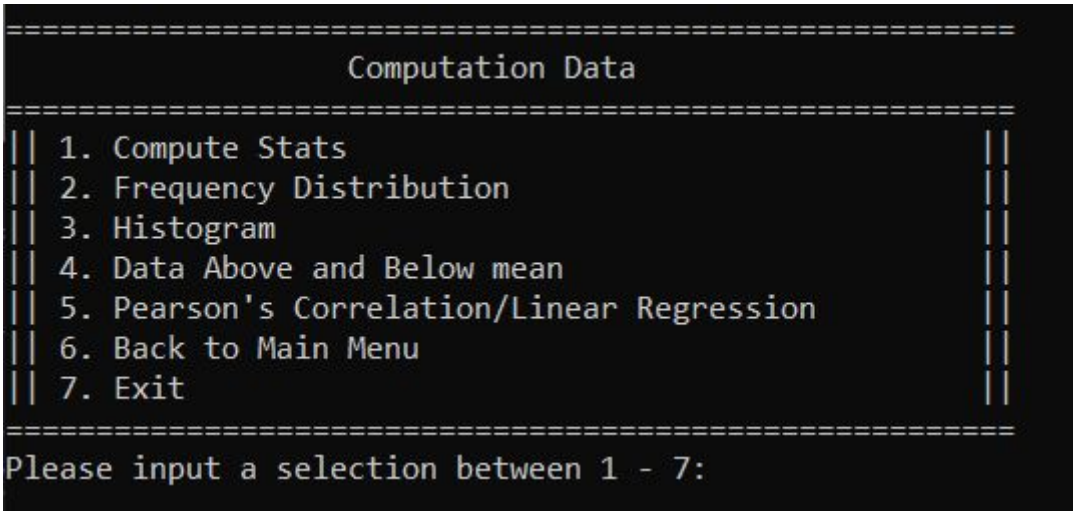


Figure 2.3

Option 2 will display a computation data menu with 7 selections and prompt user to input one of the selections.

2.3. Option 3: Sort Data by Column

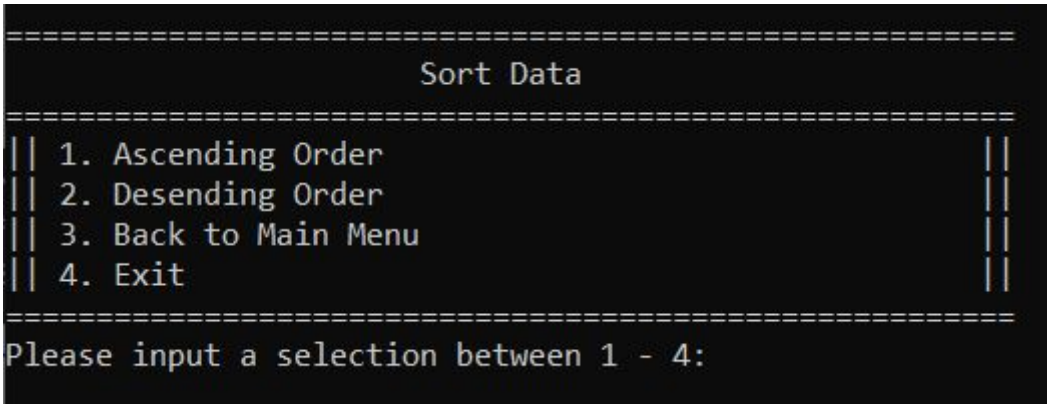


Figure 2.4

Option 3 will display a menu for user to select whether to sort the data in ascending order or descending order.

2.4. Option 4: Generate Report

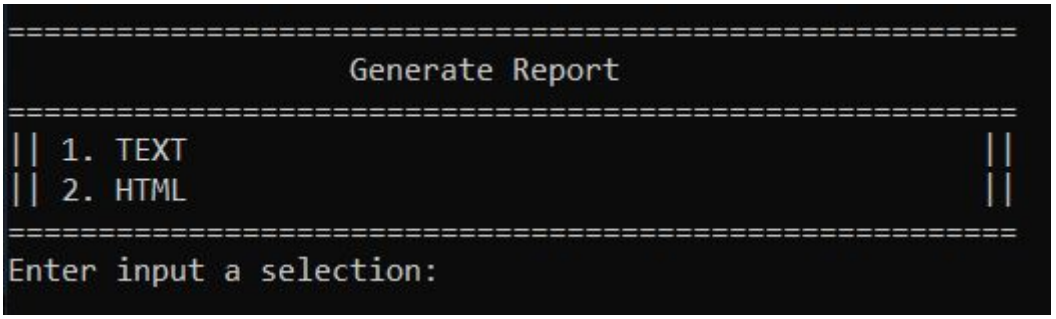


Figure 2.5

Option 4 display a table for user to select either export data in .txt file or .html file.

2.5. Option 5: Exit

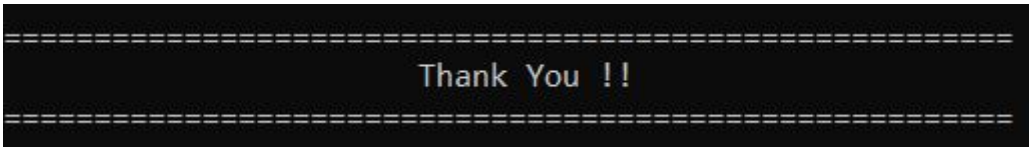


Figure 2.6

Option 5 will print a Thank You message then press any button will allow user to quit the program.

3. Compute Stats

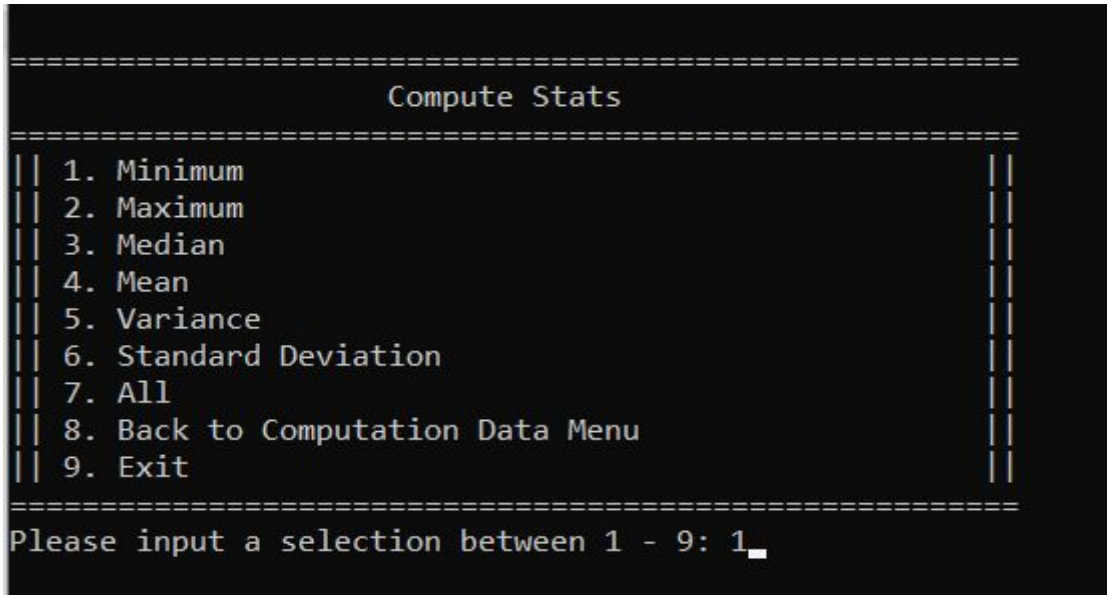


Figure 3.1

After selecting option 1 from Computation Data menu (Figure 2.3), the program will bring user to Compute Stats menu and prompt user to input a selection from 1 to 9.

3.1. Option 1 - 7: Minimum & Maximum & Median & Mean & Variance & Standard Deviation & All

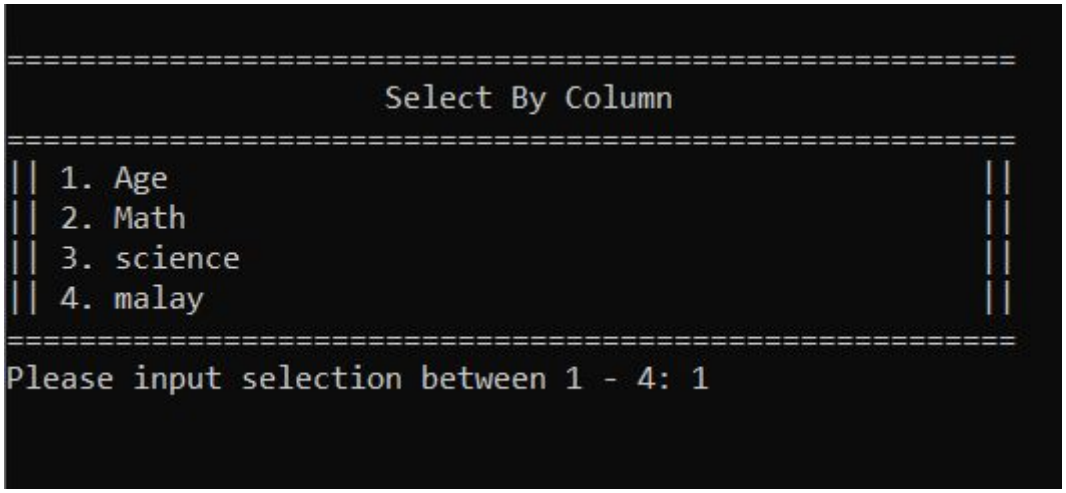


Figure 3.2

Whenever user select any selection between 1 to 7, the program will display Select by Column menu for deciding which column to compute.

3.2. Display Data

3.2.1. Display Data for one subject

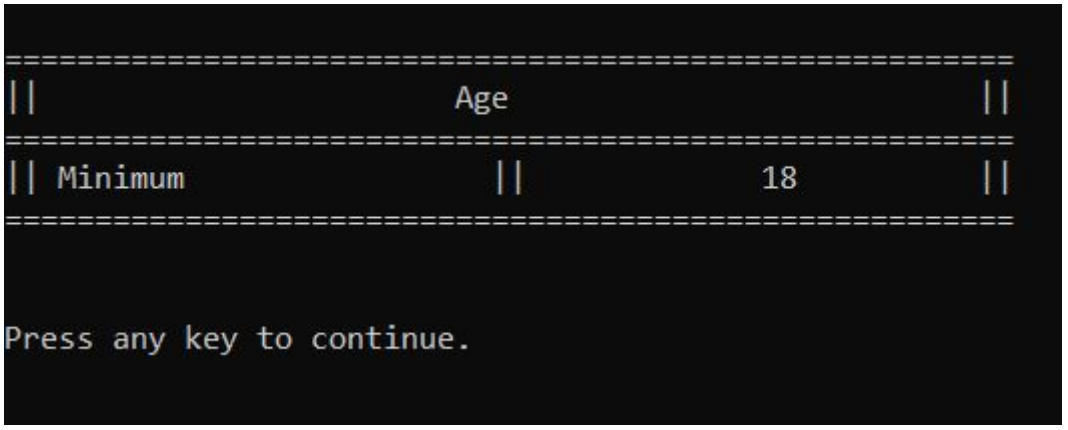


Figure 3.3

Figure above is a sample output of the Minimum value for the Age column. Then user can press any key to back to Compute Stats menu (Figure 3.1).

For Maximum, Median, Mean, Variance and Standard Deviation, the flows are the same.

3.2.2. Display Data for All

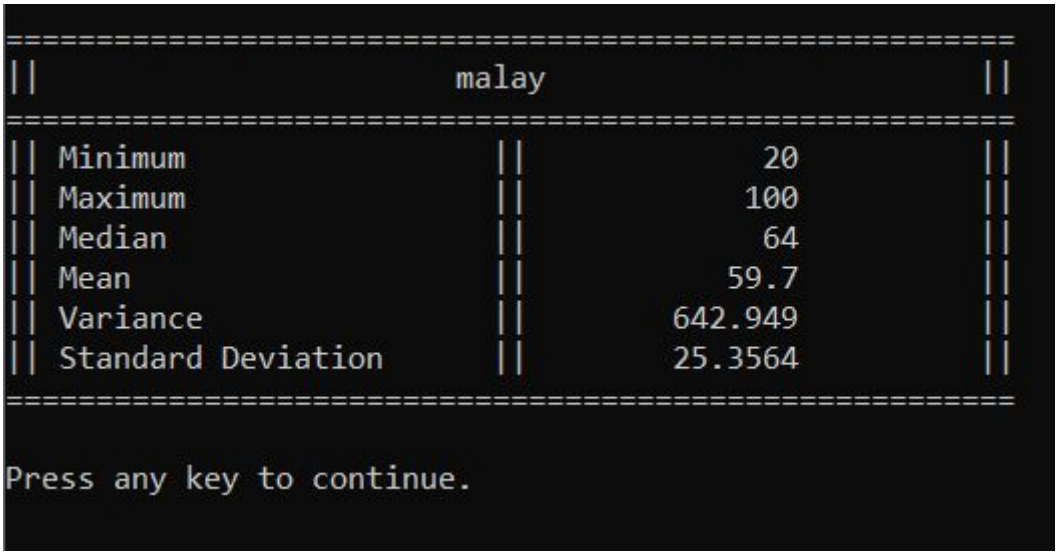


Figure 3.4

Figure above is a sample output showing all calculation results for Malay subject.

3.3. Option 8: Back to Computation Data Menu

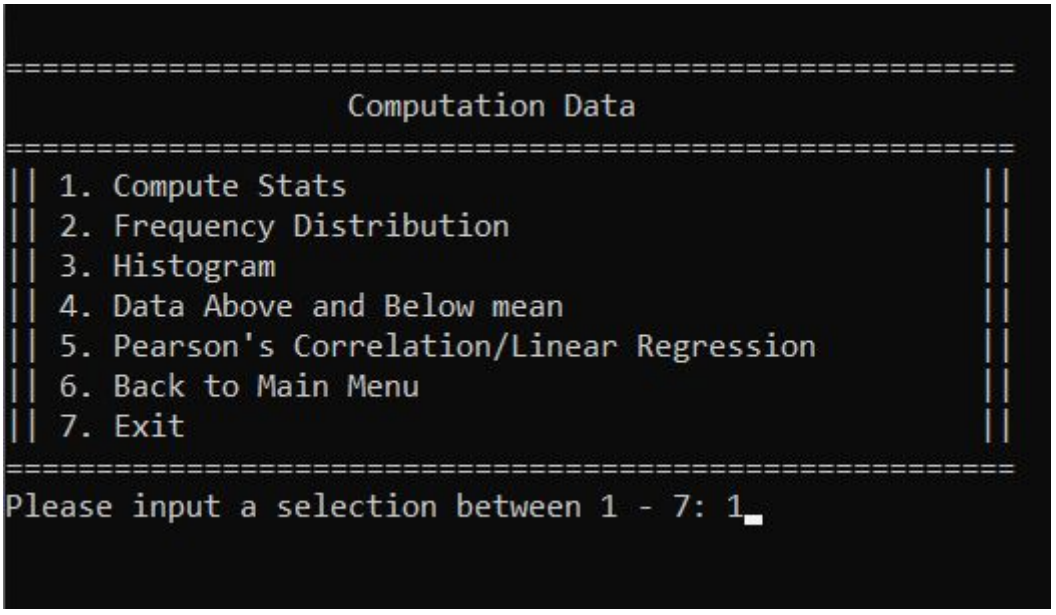


Figure 3.5

Option 8 enable user to back to the Computation Data Menu (Figure 2.3).

3.4. Option 9: Exit

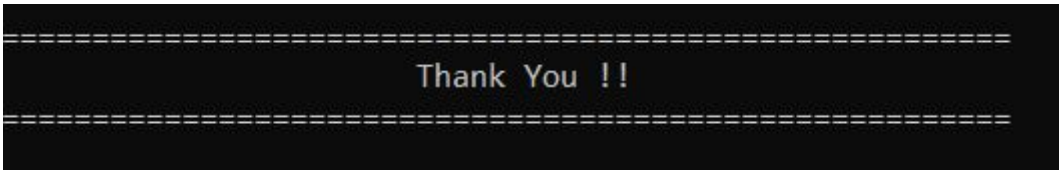


Figure 3.6

Option 9 will exit the program and show figure 3.6.

4. Frequency Distribution & Histogram & Data Above and Below Mean

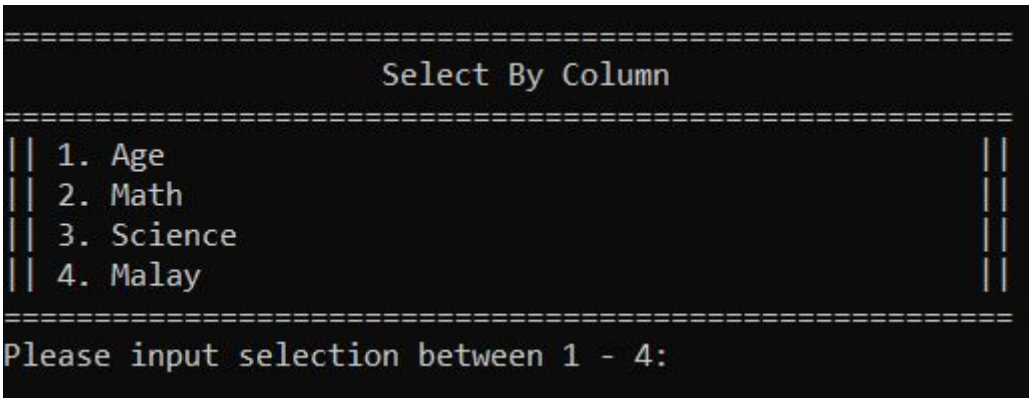


Figure 4.1

When the user enters 2/3/4 in Computation Data menu(Figure 2.3), then will proceed to Select by Column menu. User should select subject to let system know which subject data need generate to print data.

4.1. Display Data

4.1.1. Display Data for Frequency Distribution

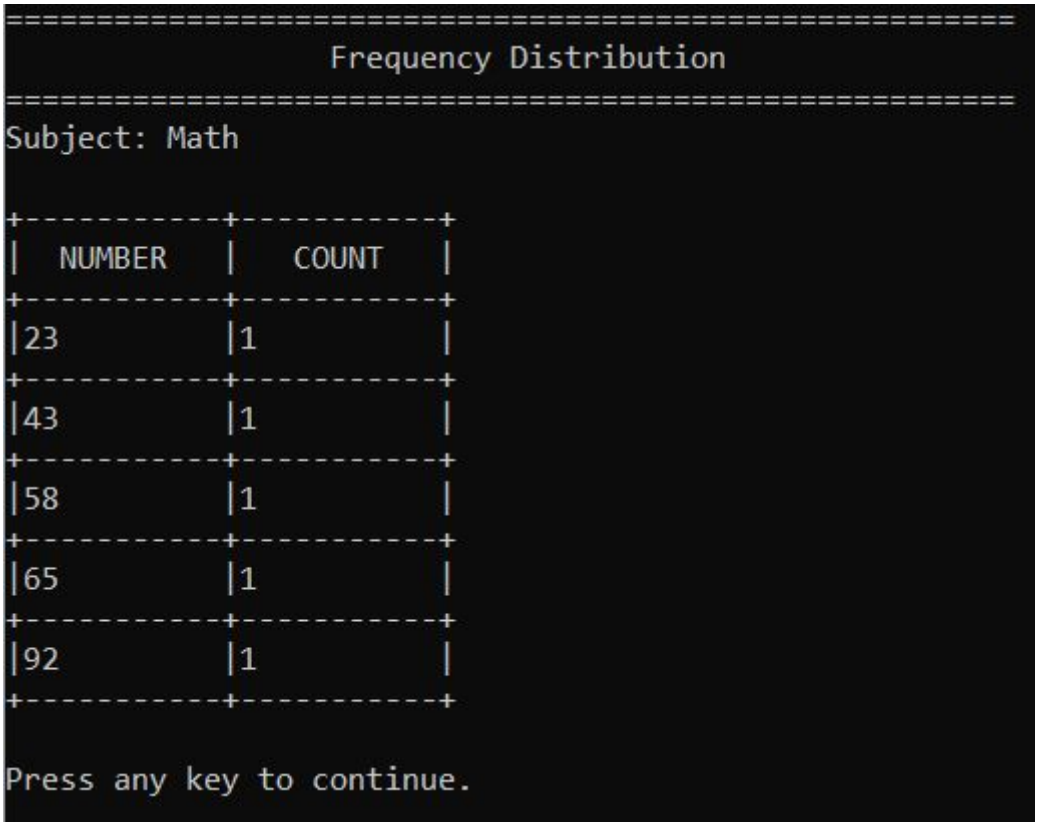


Figure 4.2

After the user selects the subject column, the table will print out the data with frequency distribution as shown as figure above.

4.1.2. Display Data for Histogram

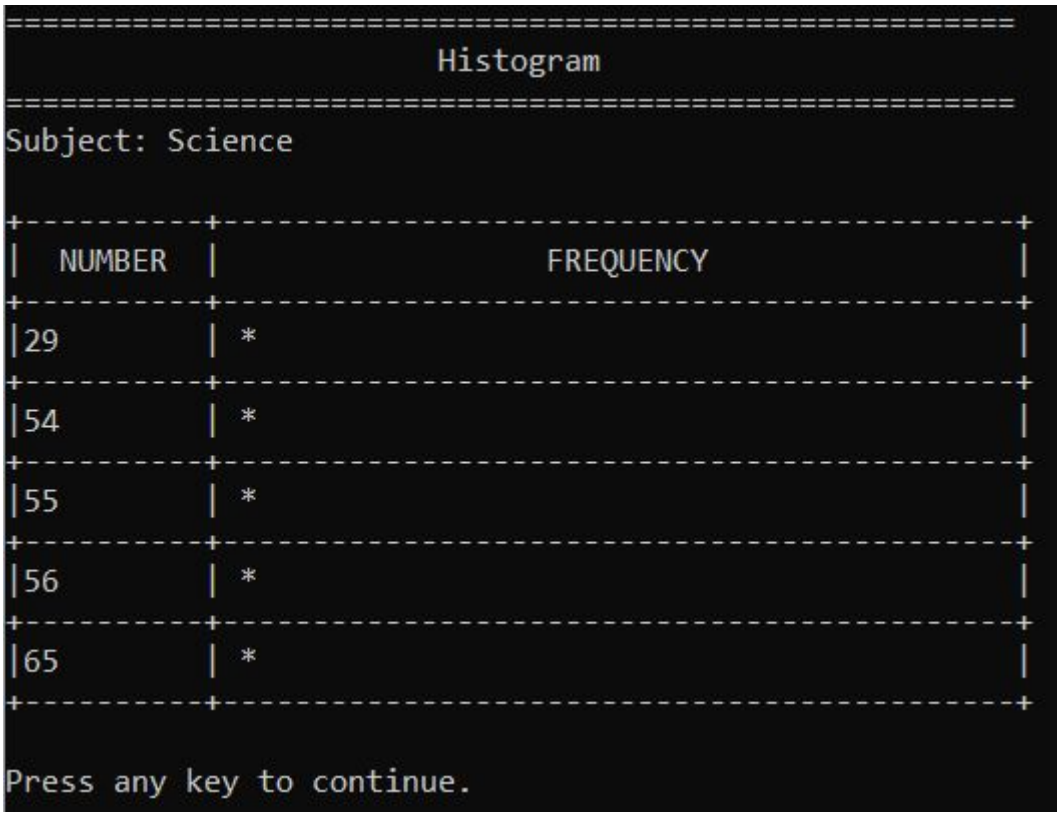


Figure 5.2

After the user selects the subject column, the table will print out the data with histogram. One (*) means for one point.

4.1.3. Display Data forData Above and Below Mean

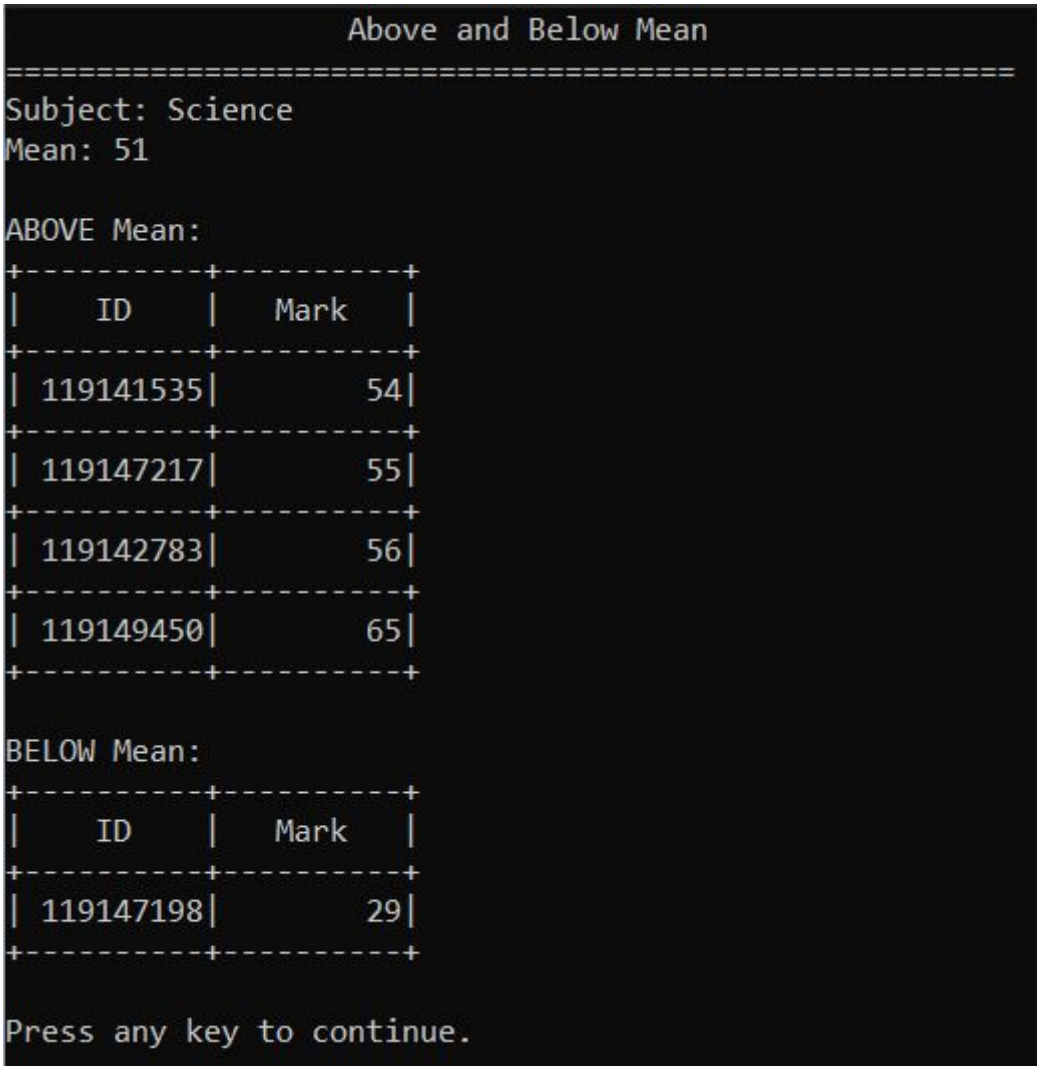


Figure 6.3

After the user selects the subject column, the table will print out the data. The table will show the title user subject selection and the mean. There are 2 tables printed, showing the table of above the mean and the table of below the mean.

5. Pearson's Correlation/Linear Regression

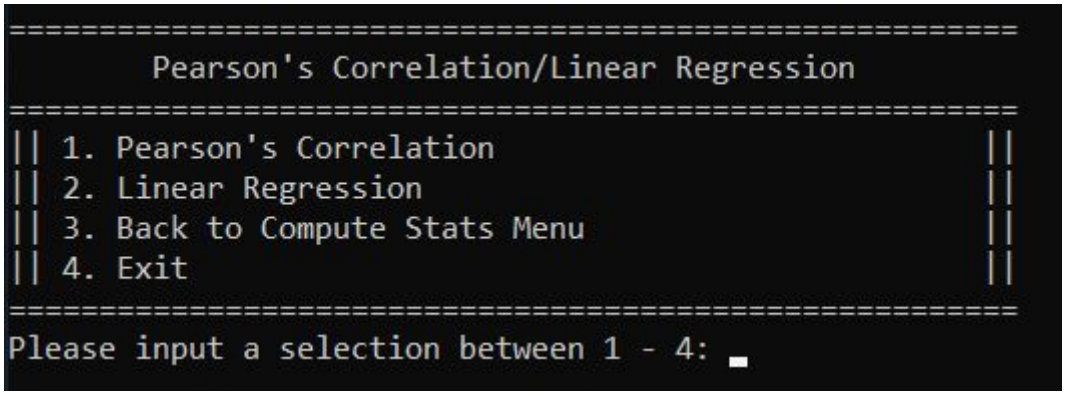


Figure 7.1

When the user selects option 5 from the Computation Data menu (Figure 2.3), this program will show a menu for Pearson's Correlation and Linear Regression and prompt the user to input a selection.

5.1. Option 1 & Option 2: Pearson's Correlation & Linear Regression

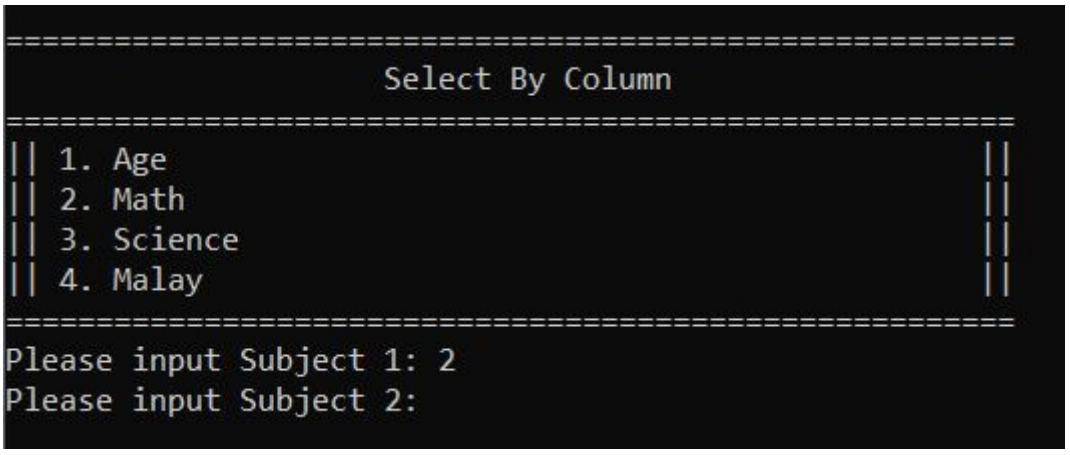


Figure 7.2

Both option 1 and option 2 will bring the user to Select by Column page to decide two columns he/she wish to calculate. Users will be prompted to input 2 selection, after input Subject 1, press Enter, then select Subject 2.

5.2. Display Data

5.2.1. Display Data for Pearson's Correlation

```
================================================================================
                          Pearson's Correlation
================================================================================
Let Science = X and Malay = Y

+----------+----------+----------+----------+----------+----------+
| ID       |     X    |     Y    |    X*Y   |    X*X   |    Y*Y   |
+----------+----------+----------+----------+----------+----------+
|         1|        29|        40|      1160|       841|      1600|
+----------+----------+----------+----------+----------+----------+
|         2|        65|        88|      5720|      4225|      7744|
+----------+----------+----------+----------+----------+----------+
|         3|        56|        88|      4928|      3136|      7744|
+----------+----------+----------+----------+----------+----------+
|         4|        54|        71|      3834|      2916|      5041|
+----------+----------+----------+----------+----------+----------+
|         5|        55|        63|      3465|      3025|      3969|
+----------+----------+----------+----------+----------+----------+
|Total     |         0|         0|     19107|     14143|     26098|
+----------+----------+----------+----------+----------+----------+
Pearson's Correlation between Science and Malay is 0.906565

Press any key to continue.
```

Figure 7.3

Figure above is the sample output of Pearson's Correlation for subject Science and Malay. Then the user can press any key back to the previous page.

5.2.2. Display Data for Linear Regression

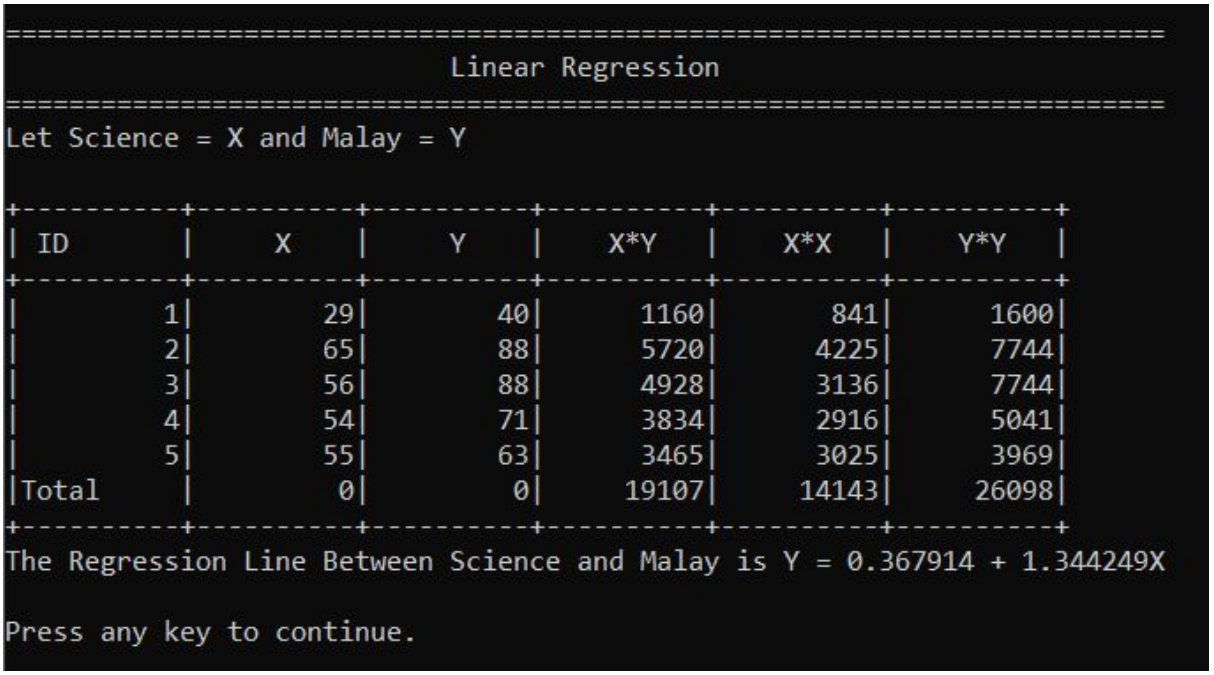


Figure 7.4

Figure above is the sample output of Linear Regression for subject Science and Malay. Then the user can press any key to go back to the previous page.

5.3. Option 3: Back to Computation Data Menu

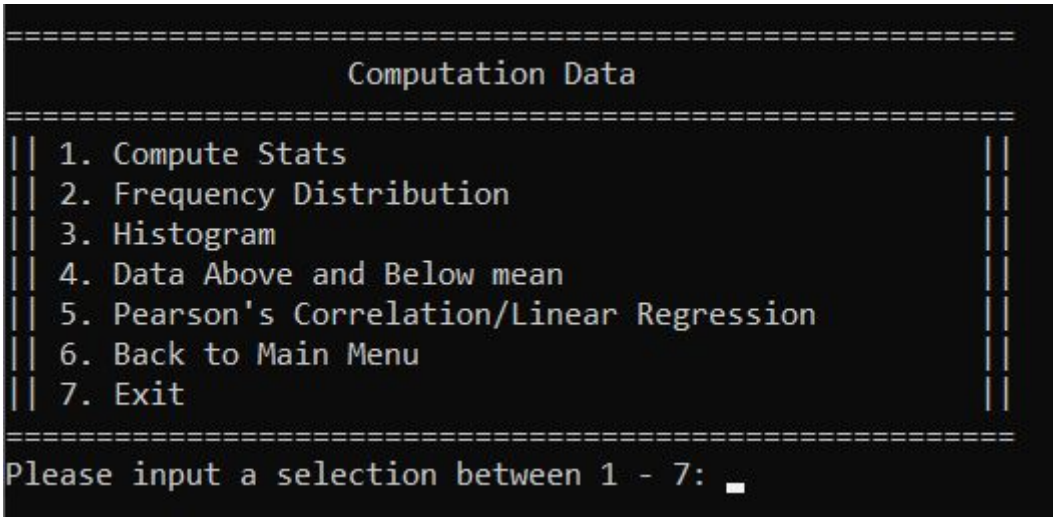


Figure 7.5

Option 3 will able user back to Computation Data menu (Figure 2.3).

5.4. Option 4: Exit

Figure 7.6

Option 4 will print a Thank You message then press any button will allow user to quit the program.

6. Sort Data by Column Menu

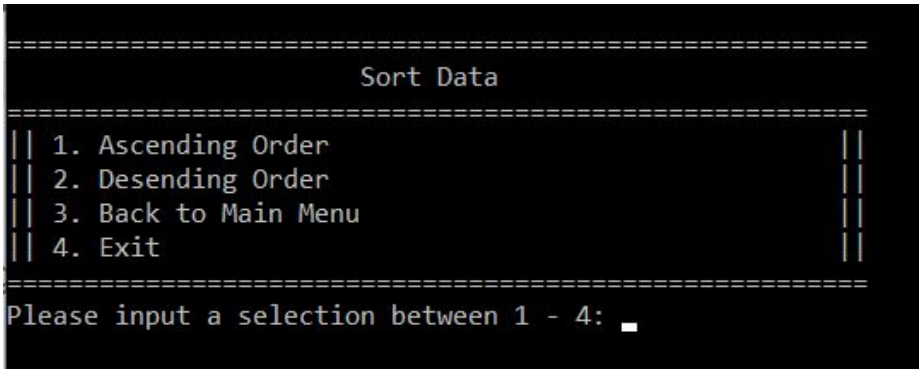


Figure 8.1

This is the menu for Sort Data by Column.

6.1. Option 1 & Option 2: Ascending Order & Descending Order

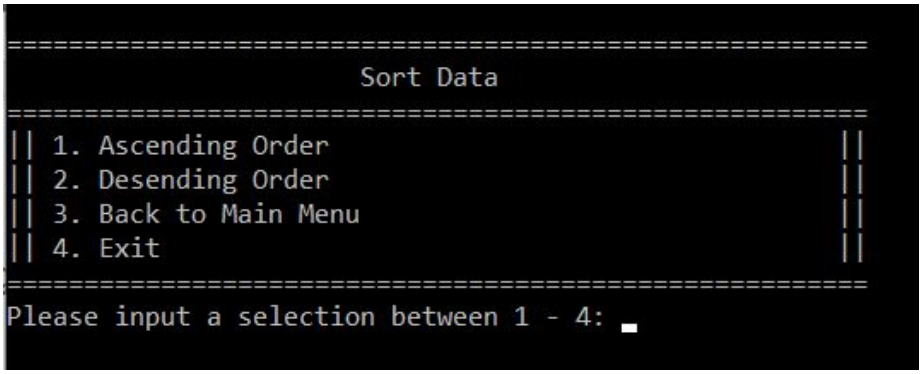


Figure 8.2

Enter 1 or 2 to display the data in ascending order and descending order respectively.

6.2. Select by Column

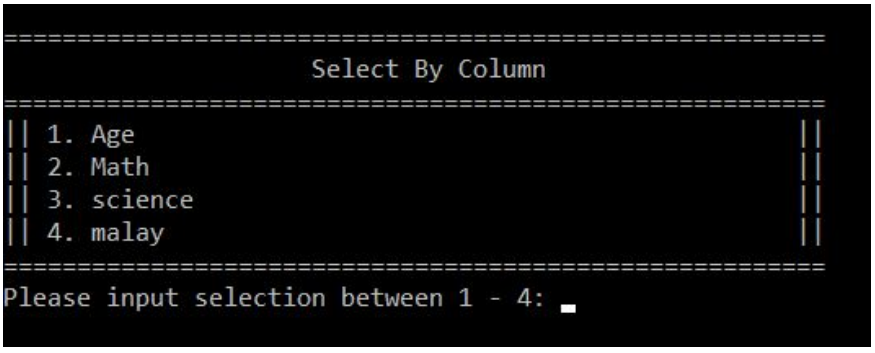


Figure 8.3

Enter 1 or 2 will bring you to this menu so that you can choose the column you desire (number of columns may vary according to your data file).

6.3. Display Data

6.3.1. Data in Ascending Order

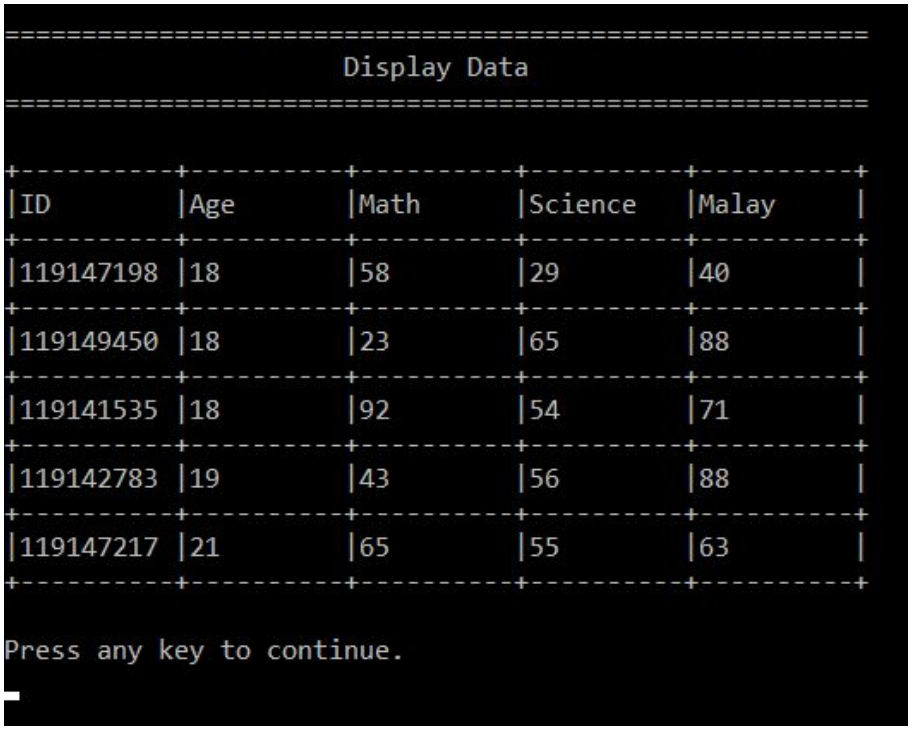


Figure 8.4

For this instance, we enter 1, which is Age, and the program will display the according to the ascending order of Age. Press any key to continue on.

6.3.2. Data in Descending Order

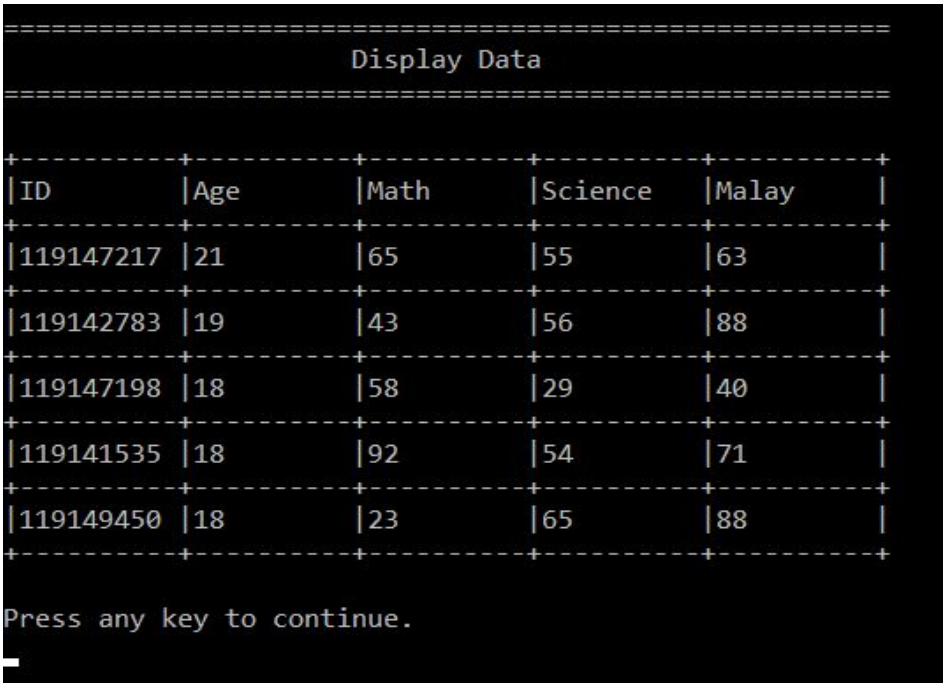


Figure 8.5

For this instance, we enter 1, which is Age, and the program will display the according to the descending order of Age. Press any key to continue on.

6.3.3. Continue to Sort Data by Column Menu

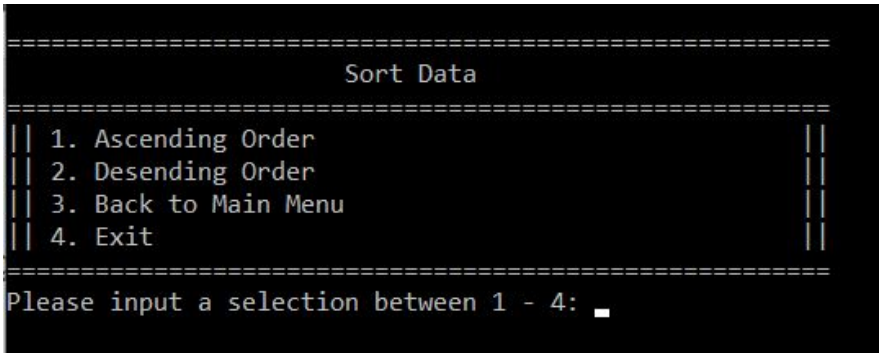


Figure 8.6

Pressing any key will bring you back to this menu.

6.4. Option 3 : Back to Main Menu

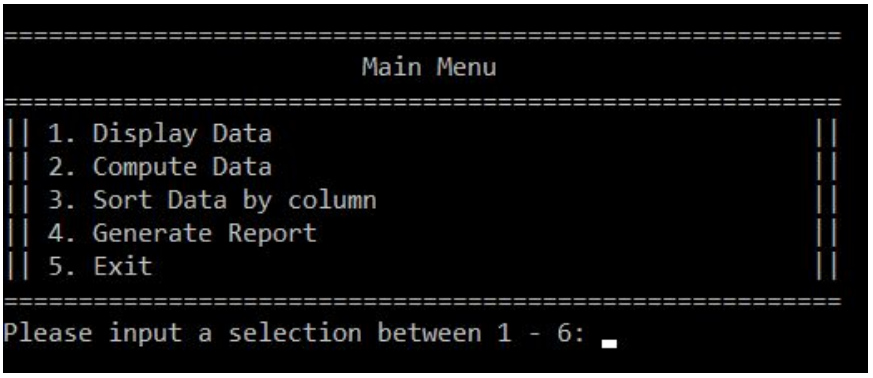


Figure 8.7

Enter 3 to go back to the Main Menu (Figure 2.1).

6.5. Option 4 : Exit

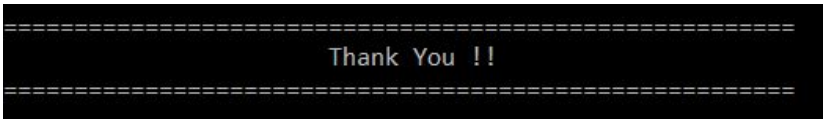


Figure 8.8

Enter 4 to exit the program.

7. Generate Report

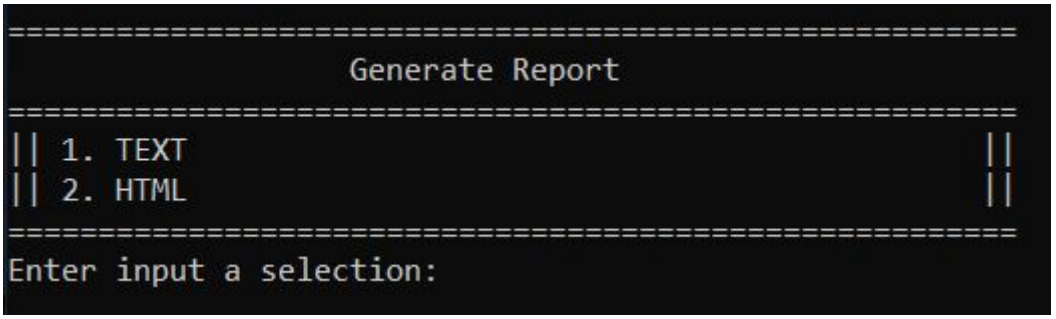


Figure 7

Menu for Generate Report.

7.1. Option 1 : Generate txt File

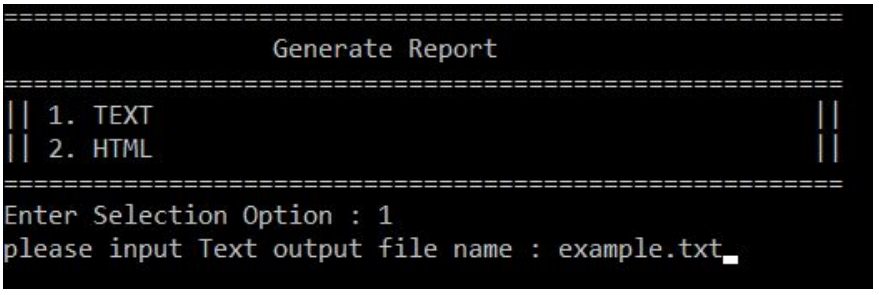


Figure 7.1

User input name for the Text File.

7.2. Option 2 : Generate html File

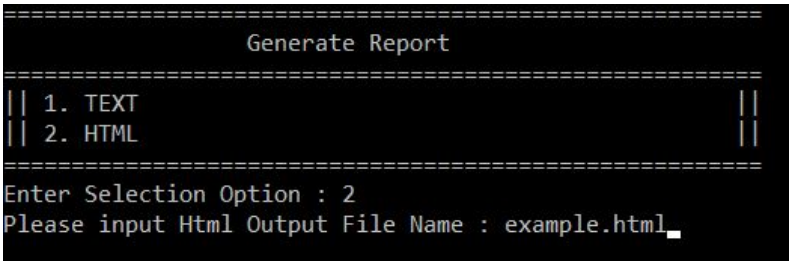


Figure 7.2

User input name for the html file.

7.3. Back to Main Menu

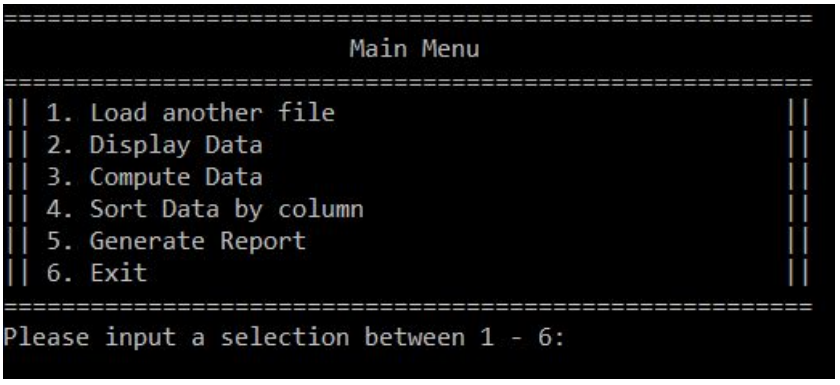


Figure 7.3

After exporting the data, the program goes back to the Main Menu.

Error

1) The CSV file imported shouldn't include double value and decimal places. If not it will cause an error. Figure 9.1 is the formal CSV file with all whole number data that our program is able to read.

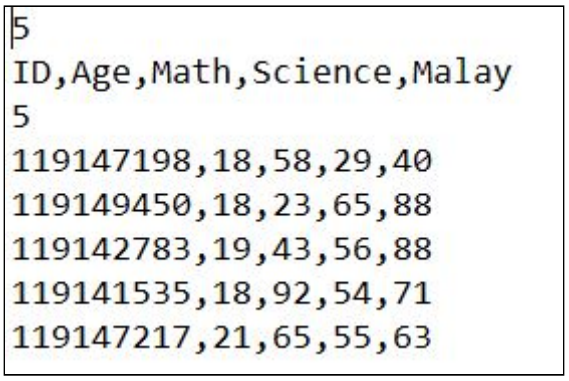


Figure 9.1

2) When the user input the selection that is not in the range of the selection, it will show Invalid input on top of the screen as Figure 9.2 shown.

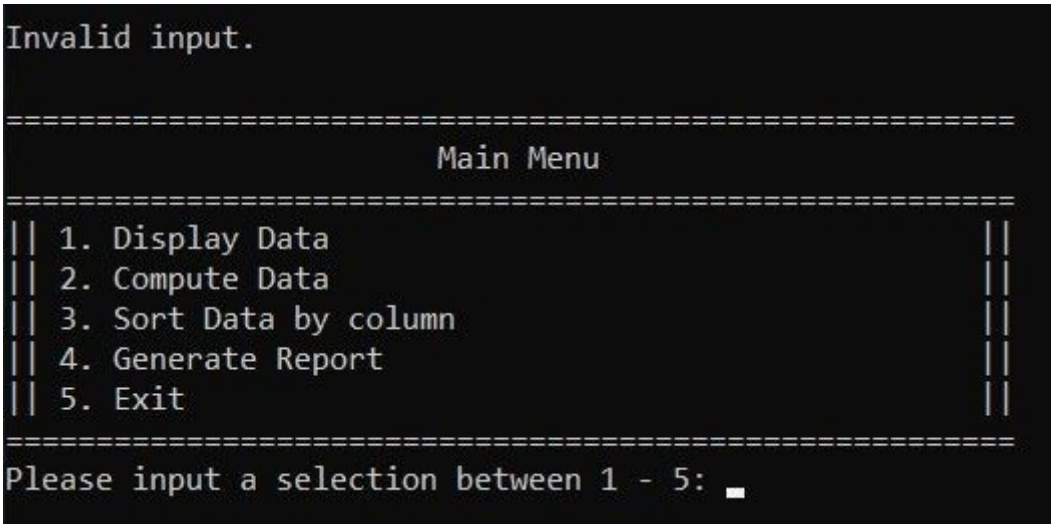


Figure 9.2

Conclusion

After completing this assignment, we've learned how to work with other people especially when it comes to coding. We've realised how better we are at communicating with each other after a few sessions of work together. We've also learned how to manage workload between each of us so it would be balanced. As for the coding part, our knowledge in C++ language has definitely increased, we were able to apply some of the theoretical C++ concepts and know more about the various C++ programming techniques. We've gotten a better understanding on how to derive and develop new class structures and organize them in a way that they will model real world systems within computers. Our basic programming concepts of C++ language such as loops, control structures, arrays and file handling have been better.

We could've managed our time better, instead of delaying the completion of the assignment. We should've gotten a better understanding of the concepts of C++ language before we started working on the assignment, since C++ is much more complex than what we learned previously, which is Python. Furthermore, we regret not listing out the design of the whole program and a deeper algorithm of the program before we started coding, it would've saved us a lot of time and unnecessary mistakes. All in all, it was a boost in terms of our knowledge in C++ language.