Assignment 1 Report

Statistical Library

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## Introduction

### Tasks

This assignment asks our group to build a statistical library that support data type char, int and double, having the following functions

1. Calculates sum
2. Calculate mean
3. Calculate standard deviation
4. Calculate variance
5. Calculate Q1, median and Q3
6. Calculate mode
7. Calculate and visualize histogram
8. Calculate and visualize noise

### Challenges

Statistics and probabilities is a rather new topic for us because we have not taken the course on this subject. To implement some functions of this project, we had to research on fundamental knowledge of statistic and probabilities.

### Requirements

1. Build a user interface support loading dataset of 3 types: char, int and double.
2. Write functions that are required for the library.

## Tool used

### Code::Block

Code::Block is the basic IDE of taught in the course. We decided to use it in this project because it is simple and easy to use.

### Git and Github

Git is a version control system that is simple and fast. A version control system helps us synchronize our code across different computers. This helps us speed up the development process tremendously.

Github[[1]](#footnote-1) is a free-to-use Git repository hosting service. It is used by more than 31 million developers across many fields, with more than 100 million repositories hosted[[2]](#footnote-2).

The Github for our project is at: <https://github.com/dalo2903/statistical-lib>

## Implementation

### Classes

To increase the modularity of the code, we decided to split the program into 3 classes that do different tasks of the program. Those classes are:

#### statistical\_lib

This class contains the main operations to perform calculations on data. It supports up to 3 types of data: char, int and double by using the defined *data* union type. The class contains a vector of data as and contains an int variable *type* to store the current type of the dataset. It contains the functions:

1. double sum()

#### data\_loader

This class implement methods to load data from files into memory. It mainly utilize **fopen()** and **fscanf()** functions of <*stdio.h*>. This class has the functions:

1. bool open\_file(string file\_name)

: Open a file using fopen(). Return true if success, false otherwise.

1. void load\_char\_data(string file\_name, vector<data> &d)

: Load data of type char from a file to a vector d.

1. void load\_int\_data(string file\_name, vector<data> &d)

: Load data of type int from a file to a vector d.

1. void load\_double\_data(string file\_name, vector<data> &d)

: Load data of type double from a file to a vector d.

#### menu\_printer

This class mainly contains functions to print out the user interface of the program. Those function are implemented mainly using *<iostream>* library for printing , <*iomanip*> and <*windows.h*> libraries for formatting. This class contains the following functions:

1. void print\_title() : Print the header of the program’s interface.
2. void print\_main\_menu\_no\_data() : Print main interface when there is no data loaded.
3. void print\_main\_menu() : Print main interface when there is no data loaded.
4. void print\_load\_data\_menu() : Print the interface of data loading process.

### Data types

#### union type

### Data structures

#### std::vector

Vector is a type of data structure containing a list of data. It is implemented

#### std::map

### Functions

#### Building

## Conclusion

## Teamwork activities

## References

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1. [Here is a numbered list which you can find in the Styles gallery.]

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1. <https://github.com> [↑](#footnote-ref-1)
2. <https://github.com/about> [↑](#footnote-ref-2)