Classroom

## Problem definition

Schoolteachers encounter a large amount of work at the end of the scholastic year, when they need to keep a record of marks gained by their students and assign grades correctly. Accuracy is important, and it is also essential to ensure that the correct grades are awarded. All this needs to be completed quickly, so that results can be sent to the students before the end of the year.

## Task definition

The *Classroom* program is meant to solve these problems by providing a solution that stores the students’ marks, assigns grades and outputs them on screen. It also calculates and displays the total, average, highest and lowest marks, as well as the number of students that obtained marks above and below average. Details of specific students can be searched, using the student’s name.

All these functions can be accessed via a menu that is easy to use and understand. Input is done through the keyboard. The interface is text-based and can be accessed via the command prompt or a terminal window.

### Inputs

* Password

To access the program, the user needs to input a numeric password. This is a special feature to ensure privacy of the students’ marks.

* Number of students

After obtaining access, the user needs to enter the number of students in the class. This value will be used throughout the program.

* Student details

The name and mark (out of 100) of each student needs to be input, using the appropriate menu option.

* Menu option

To access the different functions, the user needs to input the relative menu option.

### Outputs

* Student details

Each student’s properties, including their marks and grades, are displayed in sequential order.

* Total marks

The sum of all the marks obtained is displayed on screen.

* Average mark

The average mark within the classroom is displayed on screen.

* Highest mark

The highest mark obtained is displayed on screen.

* Lowest mark

The lowest mark obtained is displayed on screen.

* Students above average mark

The number of students that obtained a mark higher than the average mark is displayed on screen.

* Students below average mark

The number of students that obtained a mark lower than the average mark is displayed on screen.

### Special design features

* Password

To access the program, the user must enter a password, made up of a sequence of numbers. This password is hard-coded and cannot be modified.

* Menu
* Test data generation
* Visual histograms