Criterion A:

Scenario

The client is a teacher in the International Baccalaureate and IGCSE mathematics department, Mr. Erin Baker. His current role in the school is to teach classes, grade assessments, record grades of his students, and consult predicted grades(*Baker 2019*). Mr. Erin Baker teaches an array of IGCSE, International Baccalaureate across highschool.

According to Mr.Baker, there are underlying problems with the school system with regards to predicting IB grades for students: students in his grade eleven and twelve classes. He stated that teachers predict IB grades by taking the “50/50 split” of the two-semester exam grades (*Baker 2019*). He feels that “the current system does not put much emphasis on whether the student has been improving if their S1[Semester 1] exam was 5.0 and their S2 exam was a 5.9, this shows an upward trend (*Baker 2019*) . Essentially, instead of a 5.5 , the system should foretell a 6.0 due to the upward bearing. Not forgetting to mention that these are using functions in Microsoft Excel (*Baker 2019*). Furthermore, he affirmed that there is currently “no formal system,” and teachers have to pull grades from the school website after they have submitted them already, in order to predict grades. Furthermore, according to Mr.Baker, there may be discrepancies with how particular teachers predict grades: some teachers may be more strict or biased towards some students than others (*Baker 2019*) . Therefore, the current “system,” which in reality is non-existent, is not user-friendly, tedious, monotonous, and may cause unreliability in the predicted grades.

[Word Count: 246]

Proposed Product

As a student, the fact that predicted grades may not be relieved of bias from a teacher is slightly unsettling, and ultimately justifies the need for a solution. A solution to not only rid of the biases of teacher but to make the process of predicting grades easier people such Mr.Baker

To solve the problems Mr.Baker identified, my solution is to produce a sophisticated, user-friendly GUI system that enables all teachers to both manage student grades and predict IB grades. The grade prediction will be accompanied by a graph of all the grades of a particular student because Mr.Baker said it would “make it easier to see the trend[of the students].” He isn’t very “technologically-gifted” so the Window/Icon/Menu/Point (WIMP) features of a GUI application would suit him best, instead of a CLI or a Menu based system.

There is a separate excel that my client uses to manage grades.

Currently, there is no system for predicting grades, but there is a system to enter grades and log them on the online school website. Granted, it is aesthetically pleasing, but my client is only limited to *storing* grades. The new system is better than the old "system" for teachers because the grades they enter are retained in the system, so calculations of statistics are more comfortable to perform. The system is better for students because the predicted grades are calculated in a more ethical, consistent manner through the use of machine learning algorithms, hence, justifying the need for the solution.

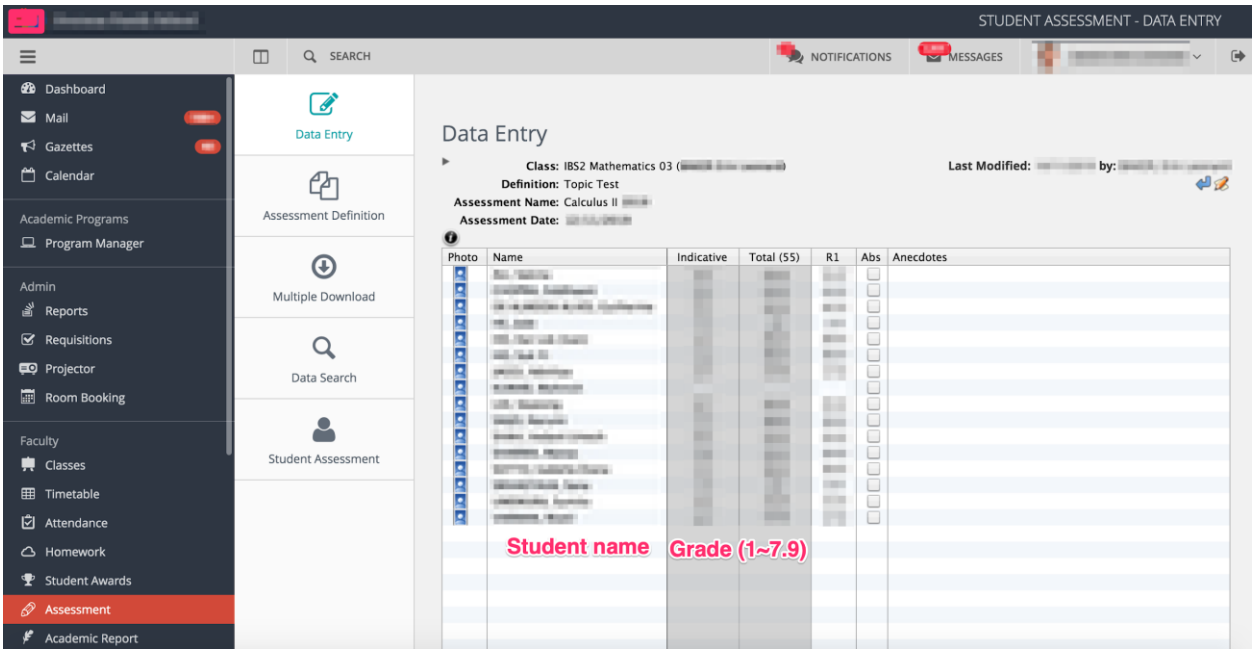

Figure 1: Current System for inputting grades (*Baker 2019*)

[Word Count: 249]

The new solution/system will be programmed in NetBeans 8.2, Java JDK8. NetBeans 8.2 is a strong GUI builder: the GUI Builder in NetBeans 8.2 supports a sophisticated yet simplified Swing Application Framework and Beans Binding, and it is free and open-source allowing me to program a high quality solution at no cost apart from time. The machine learning algorithm is more efficient to write in python using Google's Tensorflow and Keras libraries, and the code will be implemented in java using libraries to be found.

Success Criteria

1. The client must be able to enter, edit, and delete student grades
2. The client must be able to provide fluent transition between pages: within 3 clicks a user should locate anywhere
3. The system should be able to display a trend graph of student grades against time
4. The system should be able to accurately predict the grade of a student in a specific subject, and allow the teacher to have some influence
5. The system should be able to prevent the input of invalid data, incorrectly formatted data, or wrong data: there should be proper error management when data is inputted
6. The client must be able to contact a student regarding any matter
7. The client must be able to download/export student grades in easily accessible comma separated value files
8. The client should be able to add all their Classes and Students to classes, with data separate from each student.
9. The system should automatically save data so that the system does not reset every time the application is closed
10. The client should be able to obtain the grades of a student by searching through firstname, surname, or ID
11. The system Java Application must be less than 5GB total.