



# Predicting IB Subject Grade

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General Assembly DSIF 2

“RESPECT YOUR PARENTS. THEY  
PASSED SCHOOL WITHOUT GOOGLE”



# 01

## General Overview

# WHY TAKE IB DIPLOMA?

Students who study the IB Diploma cope well with transitioning to the university as they have developed investigative, research and critical thinking skills



# INTRODUCTION TO IB DIPLOMA PROGRAMME

- For students aged 16 to 19
- programme aims to develop students who have excellent breadth and depth of knowledge



# Curriculum Overview



## 6 Subject Groups

Studies in language and literature  
Language acquisition  
Individuals and societies  
Sciences  
Mathematics  
The arts



## DP Core

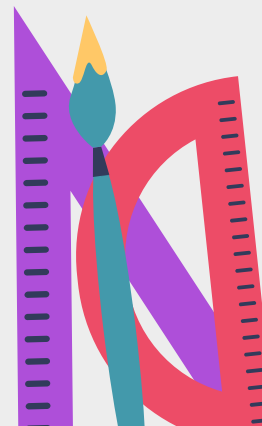
Theory of knowledge (TOK),  
Creativity, activity, service (CAS)  
Extended essay (EE).



## Exams

## Assessments

External assessment  
Internal assessment



# HOW ARE STUDENTS AWARDED WITH SUBJECT GRADE?

## Higher Level

## Standard Level

- IB awards same number of points for HL and SL subjects (Grade descriptors: ranging from Grade 1 to 7)
- HL and SL subjects differ in scope but are assessed against the same descriptors
- HL candidates are expected to demonstrate the various elements of the grade descriptors across a greater body of knowledge, understanding and skills
- In 1 of the grade descriptors, teachers will be asked for predicted grades for each subject, to support Higher Education applications and to send to the IB just before students sit final exams.
- Predicted grades are the professional judgement of the teacher, at that moment in time, of how the student will perform in the final exams





# 02

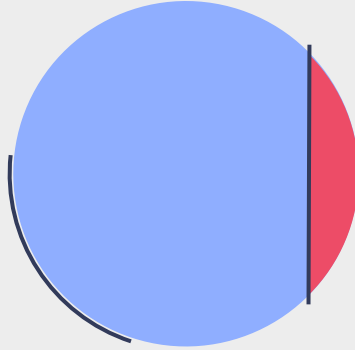
## Problem Statement



# PROBLEM VS. SOLUTION

## Problem

As the predicted grades given to the students are from a teacher's professional point of view, the school wants to eliminate human biasness



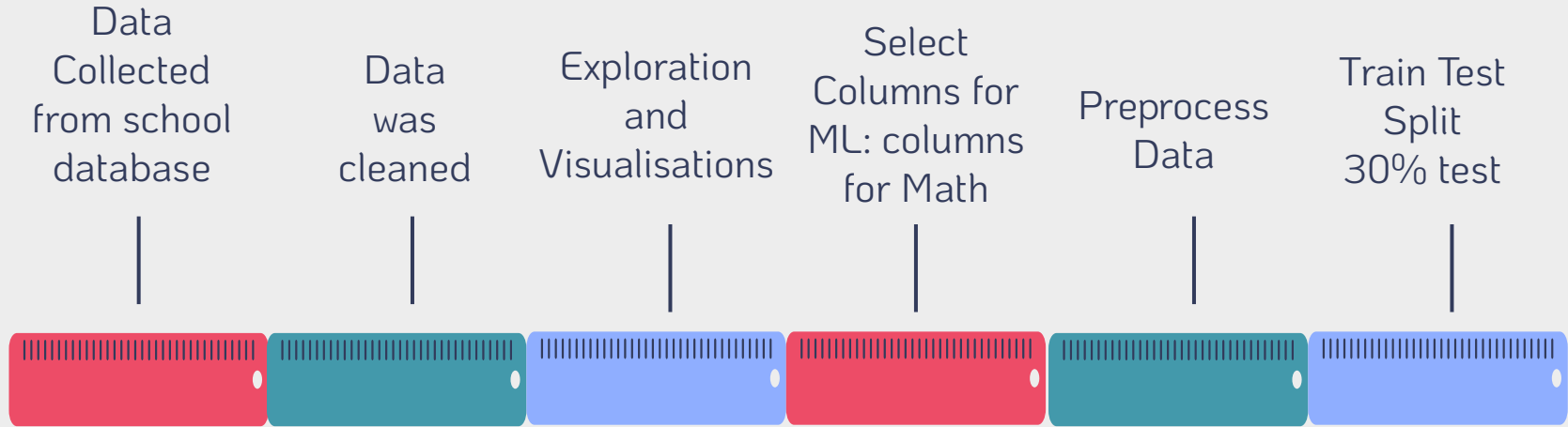
## Solution

Create a ML model in predicting the student's IB subject grade and compare it to their actual final grade to see how well the ML model works.

Students can input in their grades gotten from their markbook rubrics to get their predicted grade.



# PROCESS

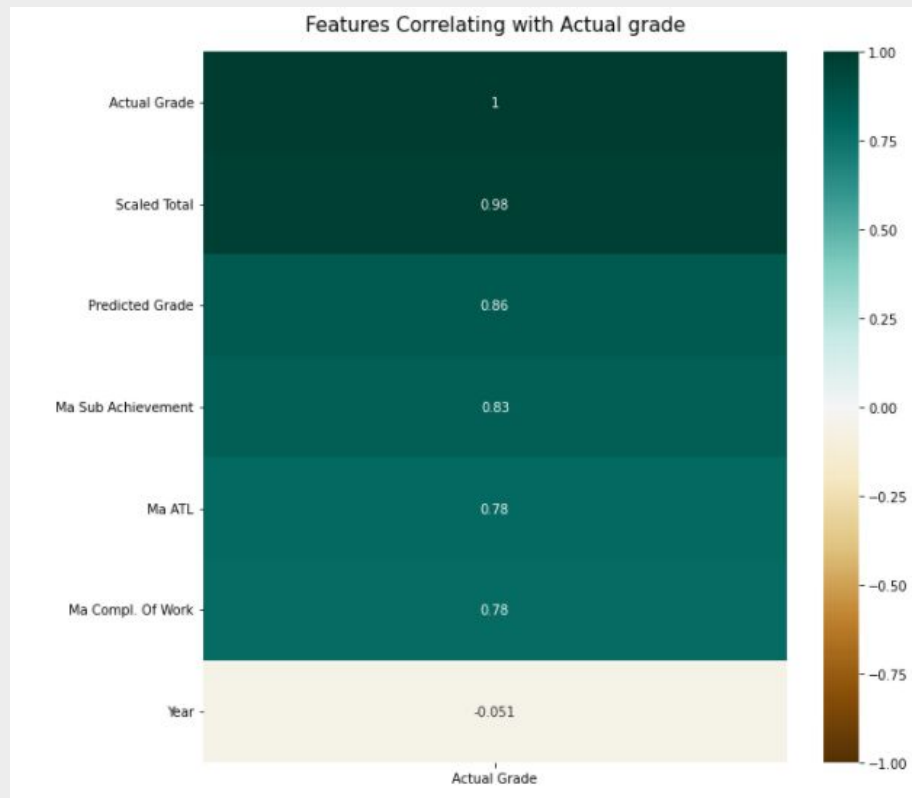




# 03

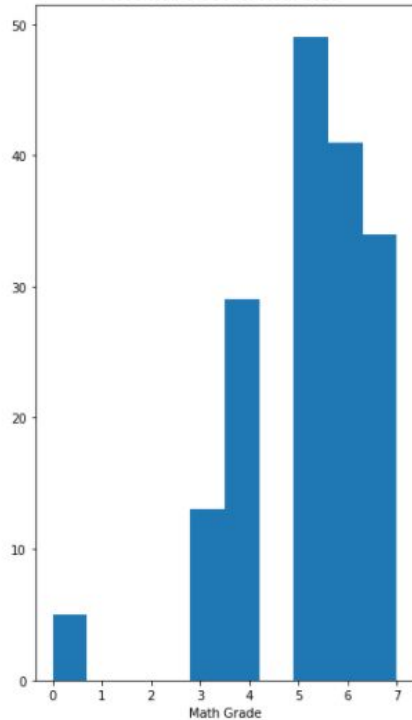
## Data Exploration

# EDA

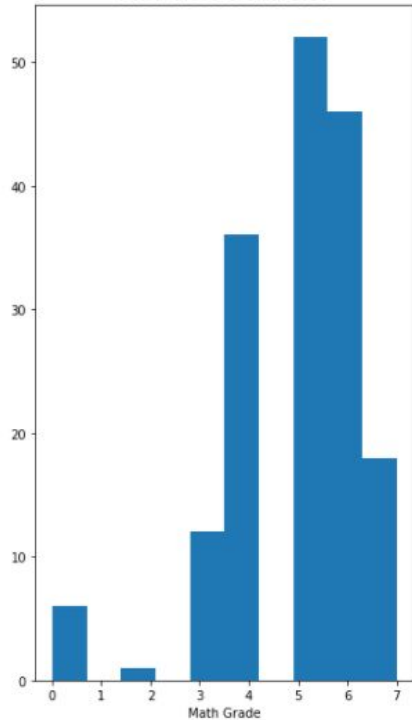


# EDA

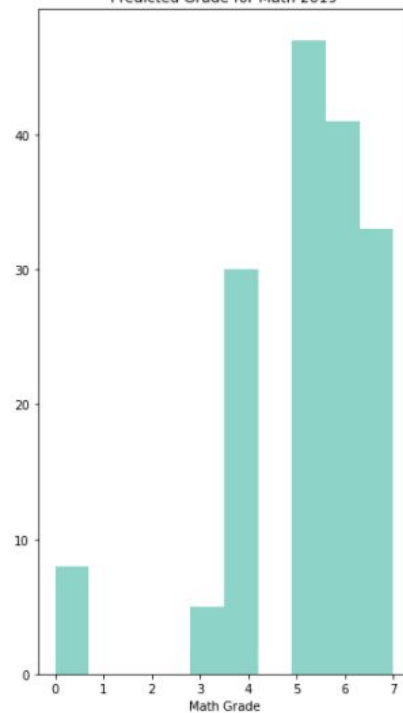
Predicted Grade for Math 2020



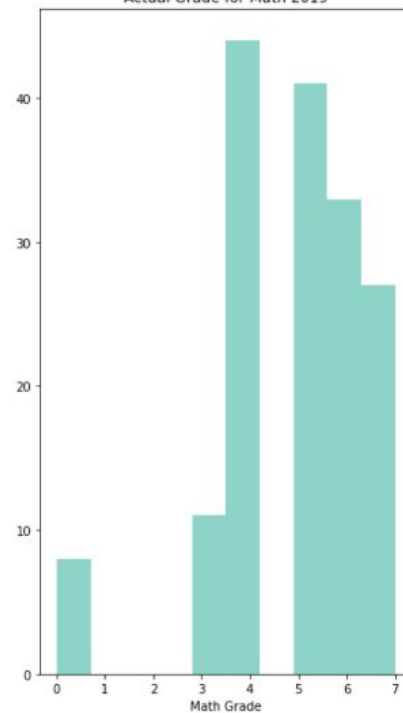
Actual Grade for Math 2020



Predicted Grade for Math 2019



Actual Grade for Math 2019





# 04

## Modelling & Results

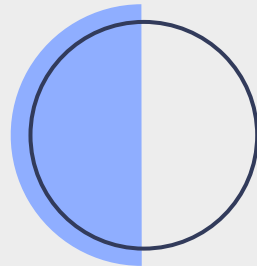
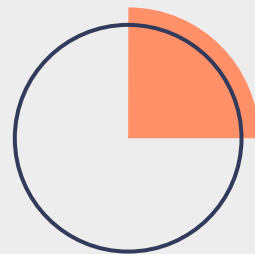
# Results

	Linear Reg.	Ridge Reg.	Lasso Reg.
Train Test	0.6871 0.6242	0.6861 0.6289	0.6862 0.6227
RMSE	0.7189	0.7203	0.7214
R <sup>2</sup>	0.6242	0.6289	0.6226

**Teacher's Prediction RMSE: 0.81012**

# Top Model's Coefficient

Subject Achievement Grade	0.7241
Completion of Work Grade	0.1608
Teacher 1	0.0936
Attitude to learning Grade	0.0797
Teacher 2	0.0739
Teacher 3	0.0486
Teacher 4	0.0448
Standard Level	0.0373
Teacher 5	0.0363
Higher Level	0.0363





# CONCLUSION & FUTURE WORKS

## Conclusion:

- Best Model: Ridge Regression
- Prediction errors given by machine learning model is lower compared to that by a human
- Subject Achievement Grade is the important factor in model

## Future Works:

- Deployment of model
- Trying with other different model



“BLAMING TEACHERS FOR THE  
PROBLEMS IN EDUCATION IS LIKE  
BLAMING DOCTORS FOR PEOPLE  
GETTING SICK”



THANK  
YOU



**Siti Alawiyah**

Linked In:



Github:

