

Predicting Students' Performance

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Business Problem

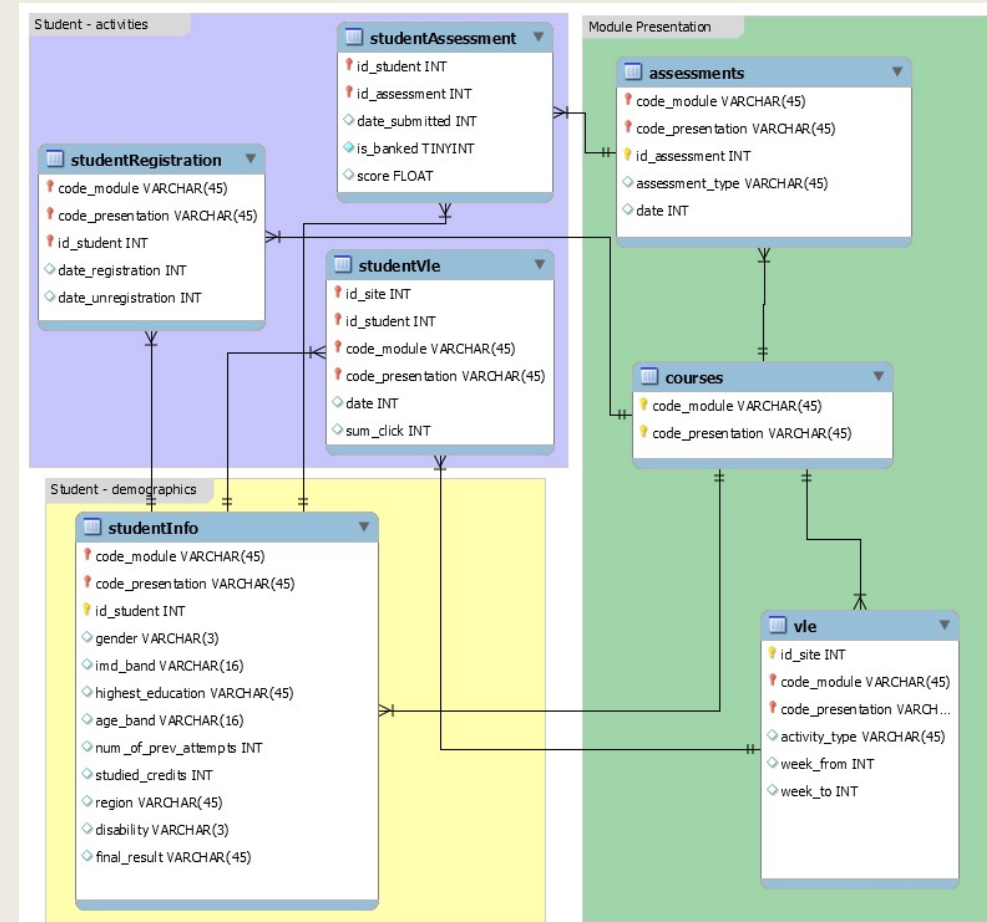
With COVID-19 accelerating online learning method, Educational Institutions are interested in increasing the success rate of the students.

- Academies are interested in gaining knowledge of students' outcomes ahead.

Business Understanding

Advantages of predicting student's performance outcome:

- Learn student's current educational status
- Navigate student in proper direction
- Improve institution's success rate



Data

Open University Learning Analytics Data:

- 7 tabular files connected via specific keys
- 3 categories of data: Demographic, Students Activities, Module Information
- 32,593 student observations, 7 modules

Figure Source: https://analyse.kmi.open.ac.uk/open_dataset

Data Cleaning

Observations from beginning of the course to half term – 135 days

Drop unnecessary features

Bin target variable into two categories: Pass and Fail

Merge required features into one table

Features and Target

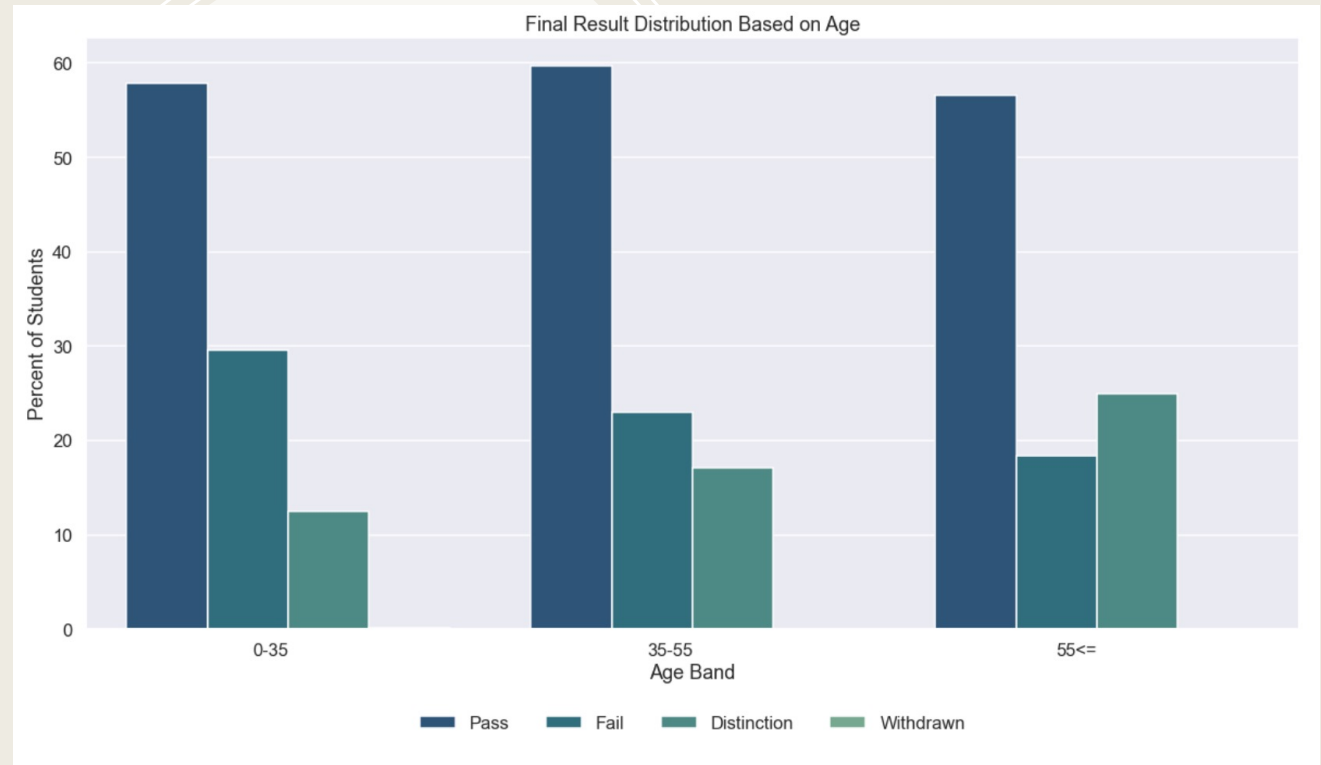
- **Features:**

- | | |
|----------------------------------|-------------------------------|
| 1. Course ID | 8. Age |
| 2. Date of registration | 9. Number of attempts |
| 3. Number of clicks on VLE | 10. Studied credits |
| 4. Gender | 11. Disability |
| 5. Region | 12. Mean score of assessments |
| 6. Highest education | 13. Length of the course |
| 7. Index of Multiple Deprivation | |

- **Target:** final result

Explorations

- With age getting higher, the rate of passing gets higher also
- Students in 55 and up range have higher values of distinct results



Exploration

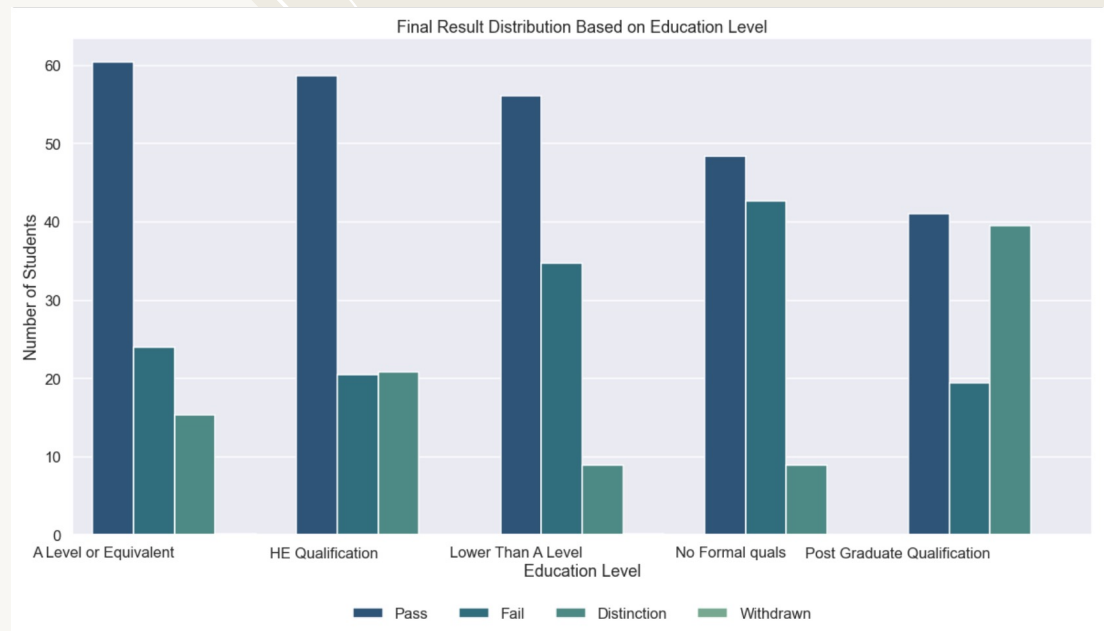
- In all groups, the passing percentage has highest value.
- The lower the level of IMD, the higher is the fail rate.

Note: Index of Multiple Deprivation (IMD)
- is the official measure of relative deprivation for small areas in England.

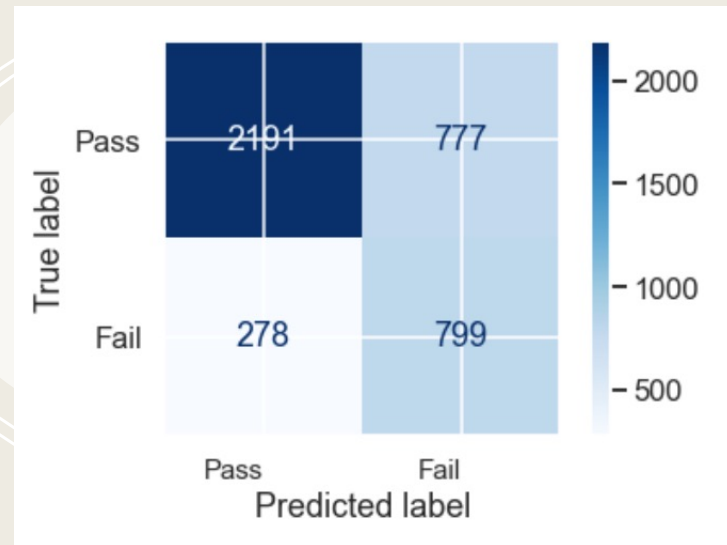
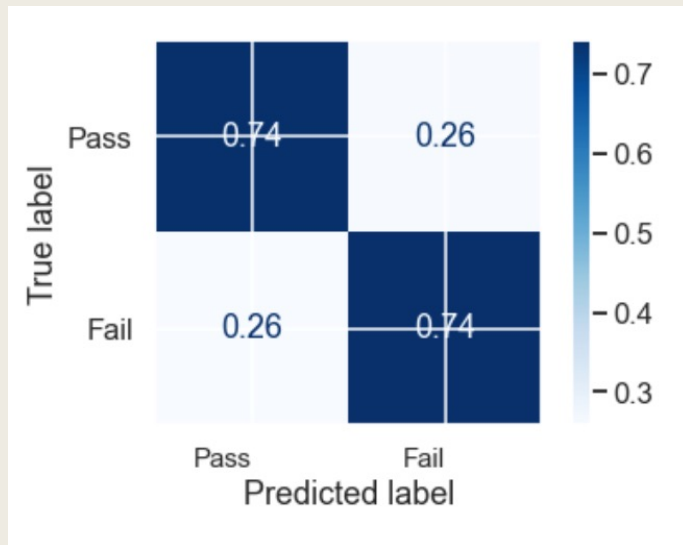


Explorations

- Students with **no formal qualifications** have lowest rate of passing.
- Students with **A level of education or lower** tend to withdraw.



	Pass	Fail	Withdraw	Distinct	Success	Failure
A Level or Equivalent	60.49	24.02	0.11	15.39	75.88	24.13
HE Qualification	58.67	20.47	0.06	20.79	79.46	20.53
Lower Than A Level	56.16	34.79	0.11	8.94	65.1	34.9
No Formal quals	48.41	42.68	0.0	8.92	57.33	42.68
Post Graduate Qualification	41.01	19.42	0.0	39.57	80.58	19.42



Modeling

- Best performed model – **Logistic Regression** with **Recall Score of 0.73** and **Accuracy Score of 0.73**.
- The model predicted **74% of failing students as failing**, and only **26% were falsely predicted as passing**.



Provide **additional study sources and tools.**



Advise students to **closely interact with online study materials**



Determine optimal course length.



Provide excessive support for **students** who are in regions **with low IMD.**



Advise students in lower age range to **closely communicate with students that are older.**

Recommendations



Thank You!

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