Machine Learning Using Python Frameworks

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Introduction

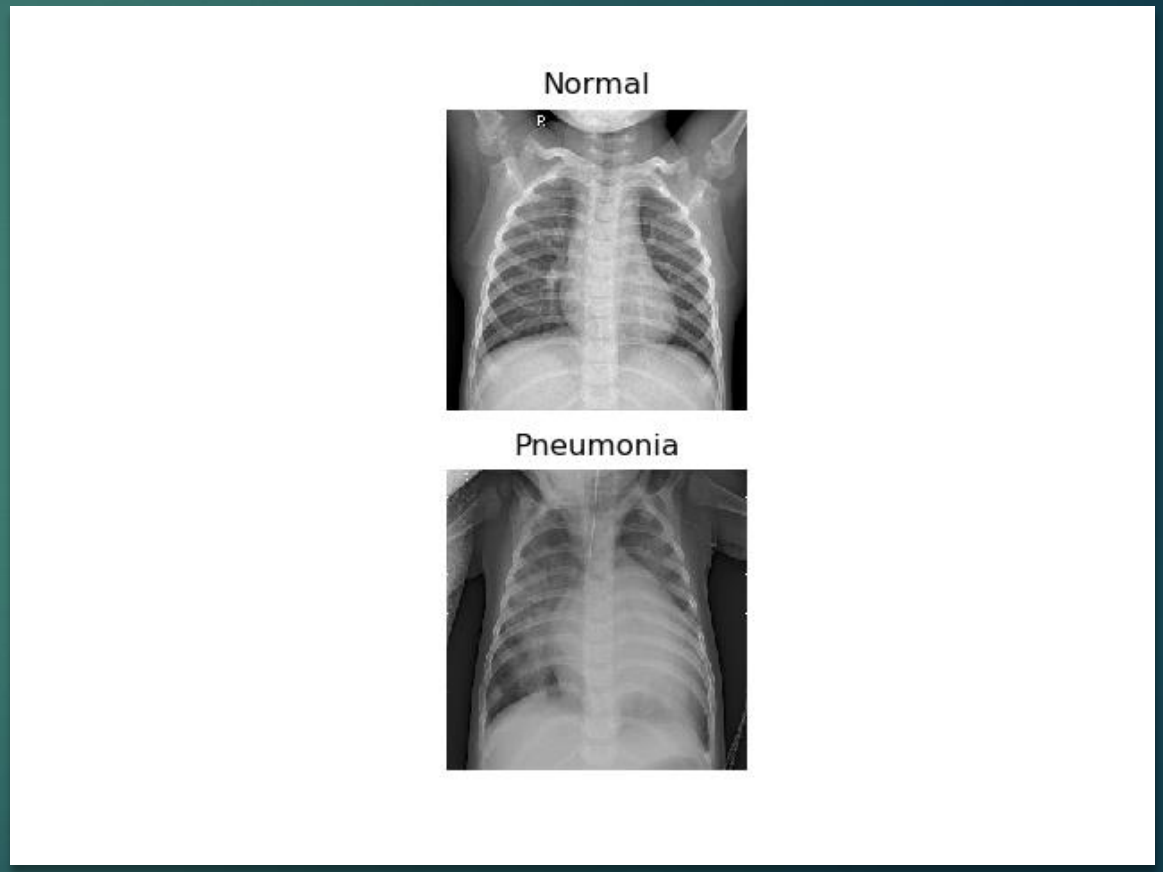
- Machine learning has advanced in recent years due to increases in computer capabilities
- This project's aim is to look at the landscape of machine learning using python frameworks.
- This presentation will show my plans for this project.

Project plan

- This project will explore the frameworks by solving 3 example problems of different types.
  - Image detection
  - Classification
  - Regression
- These examples will cover a number of features of these frameworks, such as data pre-processing and various machine learning algorithms.

Detecting Pneumonia

- Pneumonia is disease that causes an inflammation of the lungs.
- It is responsible for around 5% of deaths in Ireland annually.
- Machine learning has been used to achieve diagnosis rates comparable to doctors for diseases such as pneumonia.
- This problem should allow for demonstration of CNNs, class balancing, and different accuracy metrics.

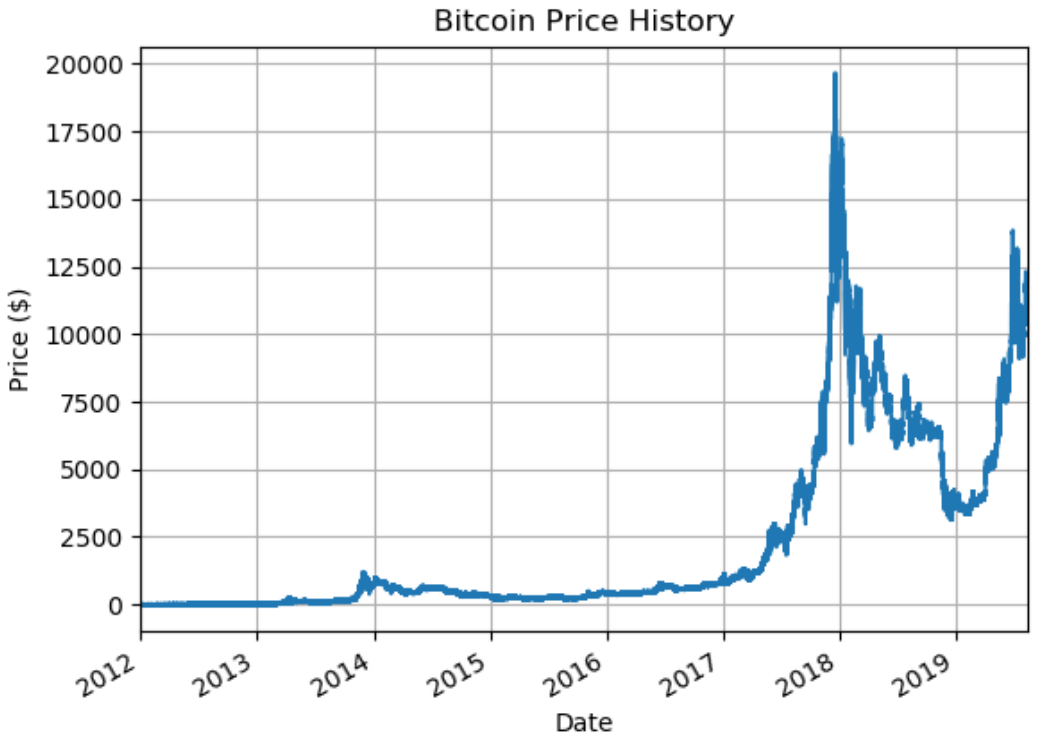


Predicting Student Performance

- This example problem looks to predict student test scores based on a number of factors, such as;
  - Parents occupation
  - Family size
  - Social life.
- This problem was chosen as it should offer a good example of data reduction and augmentation techniques, and many common machine learning algorithms are applicable

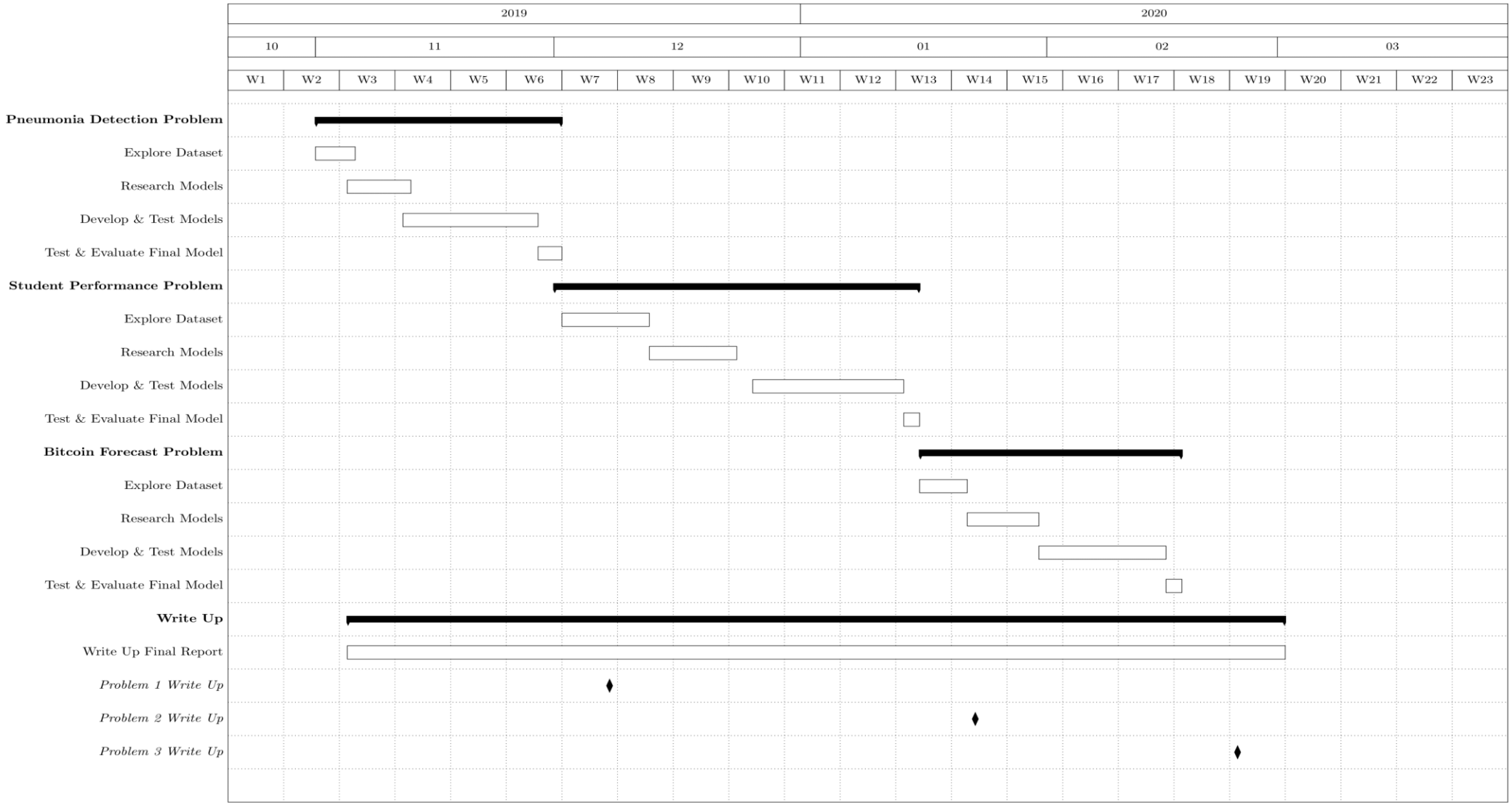
Forecasting Bitcoin Prices.

- Machine learning is often used by stock brokers and investors.
- It can be used to forecast prices or automatically trade stocks.
- This problem was chosen to demonstrate regression, and forecasting using time-series data.



Action Plan

- Each problem has been split into 4 steps;
  - Exploring the dataset (5 days)
  - Researching related problems (7 days)
  - Developing code (14 days)
  - Testing final model (2 days)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Pneumonia Detection Problem
Explore Dataset
Research Models
Develop & Test Models
Test & Evaluate Final Model
Student Performance Problem
Explore Dataset
Research Models
Develop & Test Models
Test & Evaluate Final Model
Bitcoin Forecast Problem
Explore Dataset
Research Models
Develop & Test Models
Test & Evaluate Final Model
Write Up
Write Up Final Report
Problem 1 Write Up
Problem 2 Write Up
Problem 3 Write Up

Conclusion

- This project shall be looking at common machine learning frameworks in Python.
- It will do this through by developing code for example problems.
- These problems being;
  - Detecting pneumonia
  - Predicting student performance
  - Forecasting bitcoin prices

Questions?