# **Weather Triggered Commodity Option Project**

* **Step 1: Writing a script to collect all the relevant data**
  + Historical Weather Data: Daily Maximum Temperature for Sydney Airport

The csv file is provided.

* + Historical Commodity Data: 5-minute Electricity Price Data for state NSW in Australia, URL: [AEMO | Aggregated price and demand data](https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/aggregated-data)

The data can be downloaded by month using the link at the bottom right of the page “DOWNLOAD HISTORICAL DATA”(Need to change the year and month, but please keep the region NSW unchanged). The data used is column “RRP” and we will call it Price.

Graphical user interface, text, application

Description automatically generated

* + Future Price Data: Future price for NSW, URL: [ASX Energy | ASX Energy](https://www.asxenergy.com.au/futures_au)

Need to write a web scraping script to get the future price for “New South Wales” at “Q423”(which means Q4 in 2023) and we will name it Future.

Table, calendar

Description automatically generated

* **Step 2: Design frontend UI**
  + Need a front end to take input of Strike(default is 300), Trigger for Tmax(default is 40), Start Year(default is 2000) on the left panel of the webpage.
* **Step 3: Data processing**
  + Need to filter both the Tmax and Price from Start Year to now;
  + Scale the Q4 Price data for each year to match the Future price, i.e. Price \* Future/average(Price) for Q4 for each year and we will call it Scaled\_Price
* **Step 4: Payout Calculation**
  + The formula to calculate the payout is:

For every 5-minute in Q4, Payout\_5min = if Tmax>=Trigger, max(Scaled\_Price – Strike,0), else 0. Tmax is the temperature data for that day. Then we sum all the Payout\_5min in Q4 together by year, we will get an annual payout number for each year.

* **Step 5: Output to the frontend**
  + Output the annual payout as a table;
  + Output the annual payout as a bar chart;
  + Both should be on the right panel of the webpage.

*Requirement:*

1. *Please use Python for backend coding.*
2. *Choose your choice of backend framework: Flask or Django etc. (Flask is preferred).*
3. *Pick your choice of frontend framework: React, Angular, Vue etc. (Angular is preferred).*