

Pumping out the data: Buying petrol for Mum's car

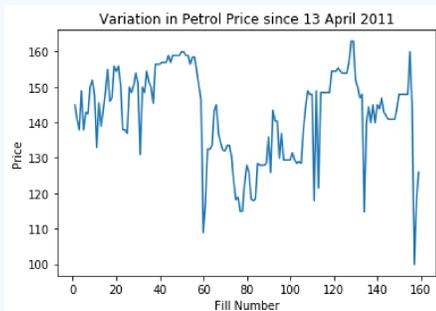


Introduction

- The aim of this project was to answer a number of interesting questions using the petrol book for the Mazda 3 bought new on 9 March 2011
- The owner nearly always runs the tank till almost empty, then fills it right to the top
- The price recorded is the amount on the pump, not including any loyalty discounts
- The petrol is nearly always unleaded E10 (records not kept of other types)
- The car was mostly used to drive 10 km per day to and from work, with occasional weekend trips to the coast or country

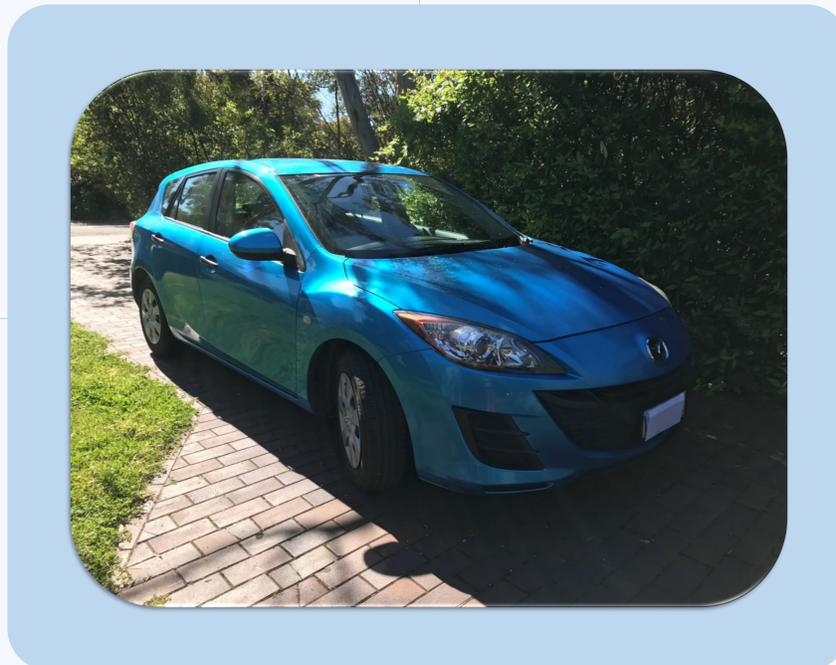
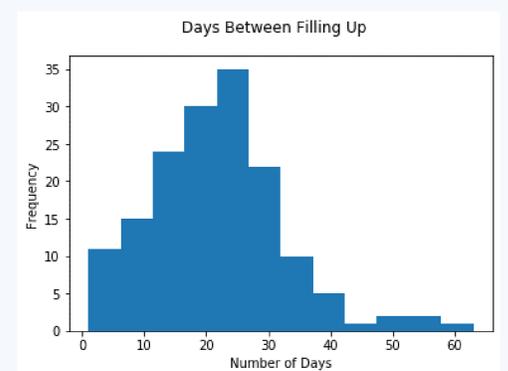
How does price change over time?

- A typical price is around 140 cents per litre
- Any trend upwards or downwards in price is actually quite hard to see over this time scale (2011 – 2020)
- There might be some upwards trend
- Because of the long periods between fills there is no clear seasonal cycle either
- Sudden drops in price occur (see “Is there a lag” for discussion on the five low points in price)



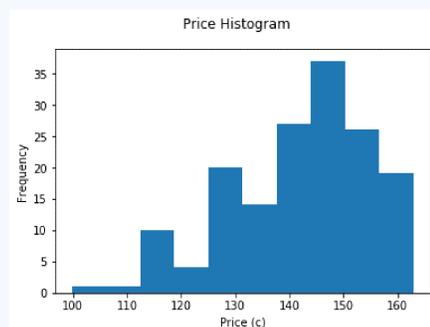
How long between fills?

- Most fills have about 21 days (3 weeks) between them
- The shortest number of days between fills (sometimes only 1 or 2) arise when the family goes on a road trip
- The longest number of days between fills was 63 days which occurred while the family were in Europe for 28 days! The next most is 55 days, during the COVID lockdown



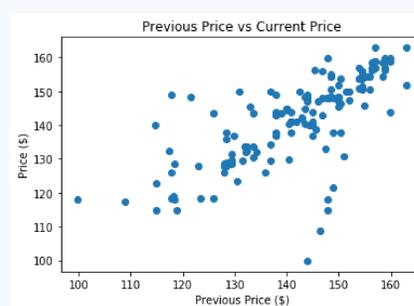
How much does petrol cost?

- There is a tail of cheaper prices
- The price varies between 99.9c and 162.9c per litre
- The cheapest was on 7/05/2020, when the Chief Minister threatened petrol companies with fines if they didn't reduce the price in line with negative oil prices during COVID
- The most expensive was on 20/10/2018



Is there a lag?

- The time between each fill and the previous one is about three weeks (see above)
- Most of the time a high price is followed by a fairly high price, and a low price by a fairly low price
- There are five exceptions
- 99.9c during COVID
- 108.9c bought in Sydney at Christmas 2014, “cheapest for years”
- 114.7c bought in Sydney on February 2019
- 114.9c twice in a row in May-June 2016, no obvious reason



Conclusions

- This data has never been analysed before, which generated lots of interesting conversations
- We now have evidence for all the above facts about the price, lags in price and time between fills that we could only guess about before
- We could make use of the data on location of petrol station (if away from home city) to see if it is true that petrol is cheaper away from home



- Daughter did the graphs in Python which she learnt at Uni last semester
- They're almost as pretty as ones Mum produced in R!