



ETC513 Assignment 3: Comparison of Energy and Pollution by Country

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Introduction

- Data Description:

This data set is [Practical driving examination results for customers](#) which is provided by local government authority (LGA) of Queensland. It records the license class, booking type, examination results and driver age group during 2005 to 2019.

- Research aims:

We divided into three parts, the first part focuses on the annual pass rate of different local government authority.

The second part mainly aims to compare the age group with different license.

The third part calculates the correlation between the examination results and booking type.

Step 1

The first part focuses on the annual pass rate of different local government authority.

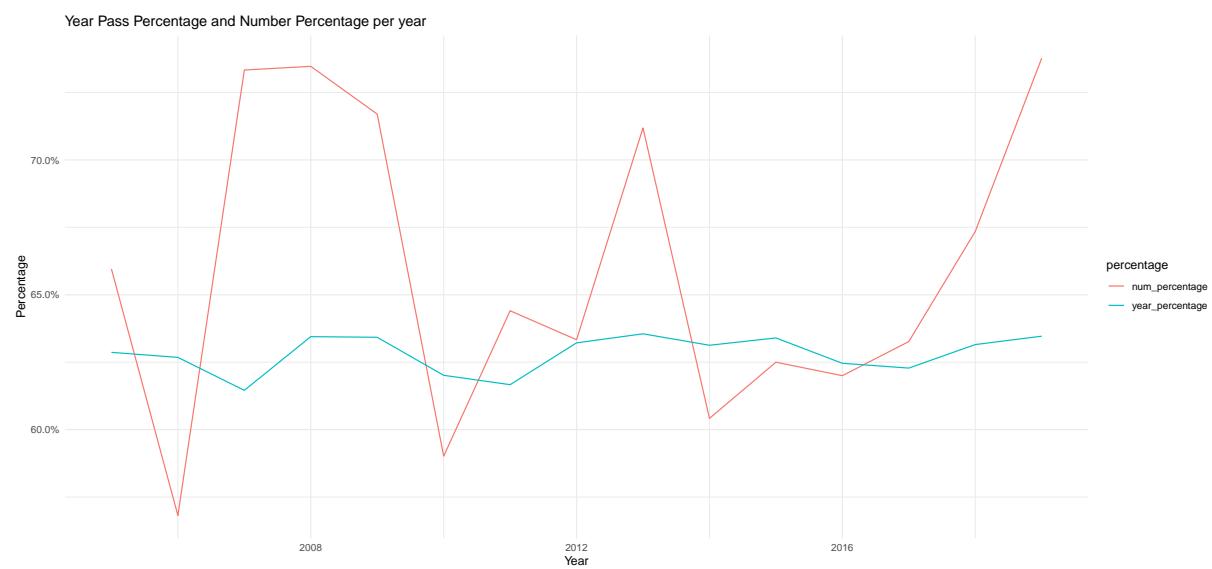


Figure 1: Year Pass Percentage(*year_percentage*) and Percentage of Local Government Authority annual passing rates exceeding the total annual passing rate(*num_percentage*)

In the figure 1, as for the annual pass rate, it does not fluctuate greatly, and basically remained at 62.5% but the percentage of the number exceeding the annual pass rate fluctuates greatly, which

Table 1: Number of time getting the highest pass rate per year

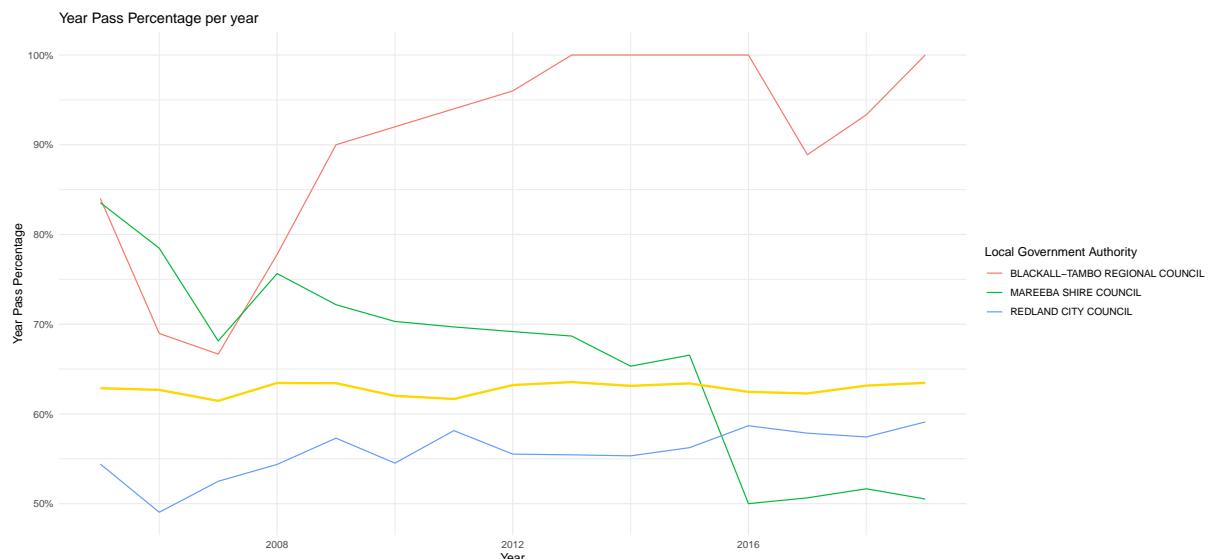
Local Government Authority	count
BLACKALL-TAMBO REGIONAL COUNCIL	5
BALONNE SHIRE COUNCIL	4
HOPE VALE ABORIGINAL SHIRE COUNCIL	4
MOBILE SERVICES	4
BARCALDINE REGIONAL COUNCIL	3
BURKE SHIRE COUNCIL	3

Table 2: Number of time getting the lowest pass rate per year

Local Government Authority	count
MAREEBA SHIRE COUNCIL	2
NAPRANUM ABORIGINAL SHIRE COUNCIL	2
REDLAND CITY COUNCIL	2
BURDEKIN SHIRE COUNCIL	1
HOPE VALE ABORIGINAL SHIRE COUNCIL	1
KOWANYAMA ABORIGINAL SHIRE CONUNCIL	1

may be due to missing data in some regions, however, from the data point of view, it has been in an upward phase in recent years.

In the table 1, BLACKALL-TAMBO REGIONAL COUNCIL has the most number of first (5 times). In the table 2, MAREEBA SHIRE COUNCIL, NAPRANUM ABORIGINAL SHIRE COUNCIL, REDLAND CITY COUNCIL have won the last 2 times.

**Figure 2:** Year Pass Percentage in BLACKALL-TAMBO REGIONAL COUNCIL, BLACKALL-TAMBO REGIONAL COUNCIL, and REDLAND CITY COUNCIL

According to the figure 2, the annual pass rate of BLACKALL-TAMBO REGIONAL COUNCIL has been on the rise after 2007, even reaching 100%, while the annual pass rate of MAREEBA SHIRE COUNCIL is in a downward state, and the annual pass rate of REDLAND CITY COUNCIL basically fluctuates at 55%. Especially, MAREEBA SHIRE COUNCIL and REDLAND CITY COUNCIL have been lower than the annual pass rate since 2015, which the gold line is year pass rate.

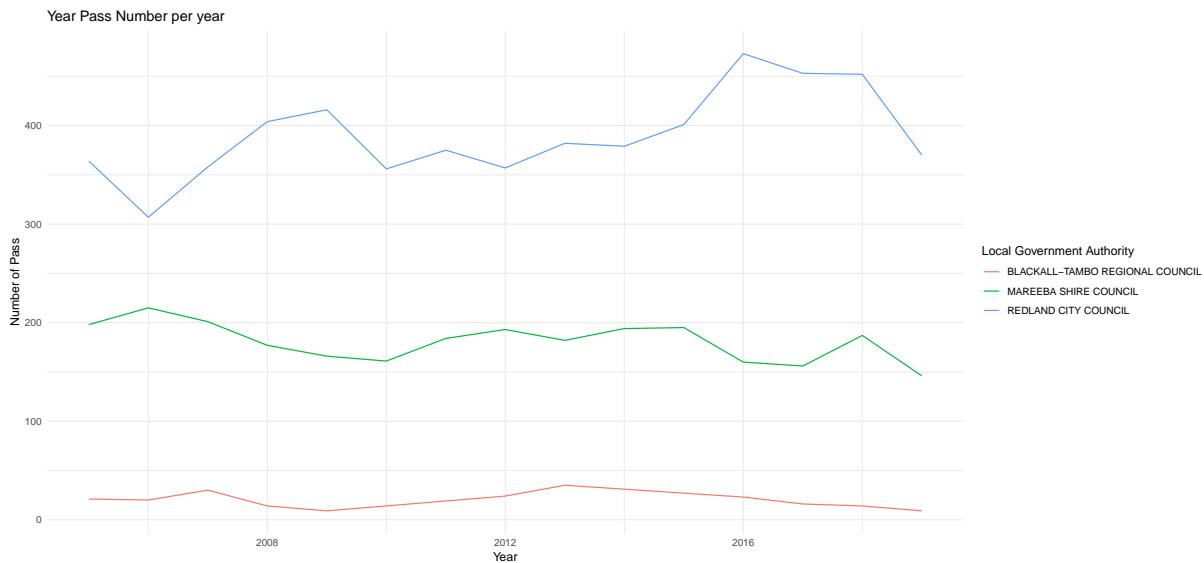


Figure 3: Year Pass Number in BLACKALL-TAMBO REGIONAL COUNCIL, MAREEBA SHIRE COUNCIL, and REDLAND CITY COUNCIL

In the figure 3, the number of pass for three government authorities basically has little fluctuation. Interestingly, the ranking of the number of passes and the ranking of the pass rate are completely opposite.

Therefore, the annual pass rate has not changed much, the percentage of the number exceeding the annual pass rate fluctuates greatly. Areas with sparsely populated areas may have fewer people participating, resulting in a higher overall pass rate than areas with densely populated areas.

Step 2

The driving examination pass rate of Queensland is 63% .

- The table 3 is the pass rate of different licenses. Above all, the automatic car has the lowest passing rate with 53%, Since the car has the largest amount of popularity to meet people daily command, so there are more people to join the test of cars.

Table 3: The pass rate of each product type

Product Type Name	pass_rate
CLASS CA - CAR (AUTOMATIC)	53%
CLASS C - CAR (MANUAL)	56%
CLASS HR - HEAVY RIGID VEHICLE	70%
CLASS MR - MEDIUM RIGID VEHICLE	77%
CLASS RE - MOTORCYCLE (UP TO 250CC)	77%
CLASS HC - HEAVY COMBINATION VEHICLE	79%
CLASS LR - LIGHT RIGID VEHICLE	83%
CLASS R - MOTORCYCLE (OVER 250CC)	86%

- While the motorcycle over 250cc has the largest pass rate with 86%. The motorcycle is much more professional, and it required people got the license up to 250cc who can take part in the test. Therefore, these people are professional so got a higher rate.

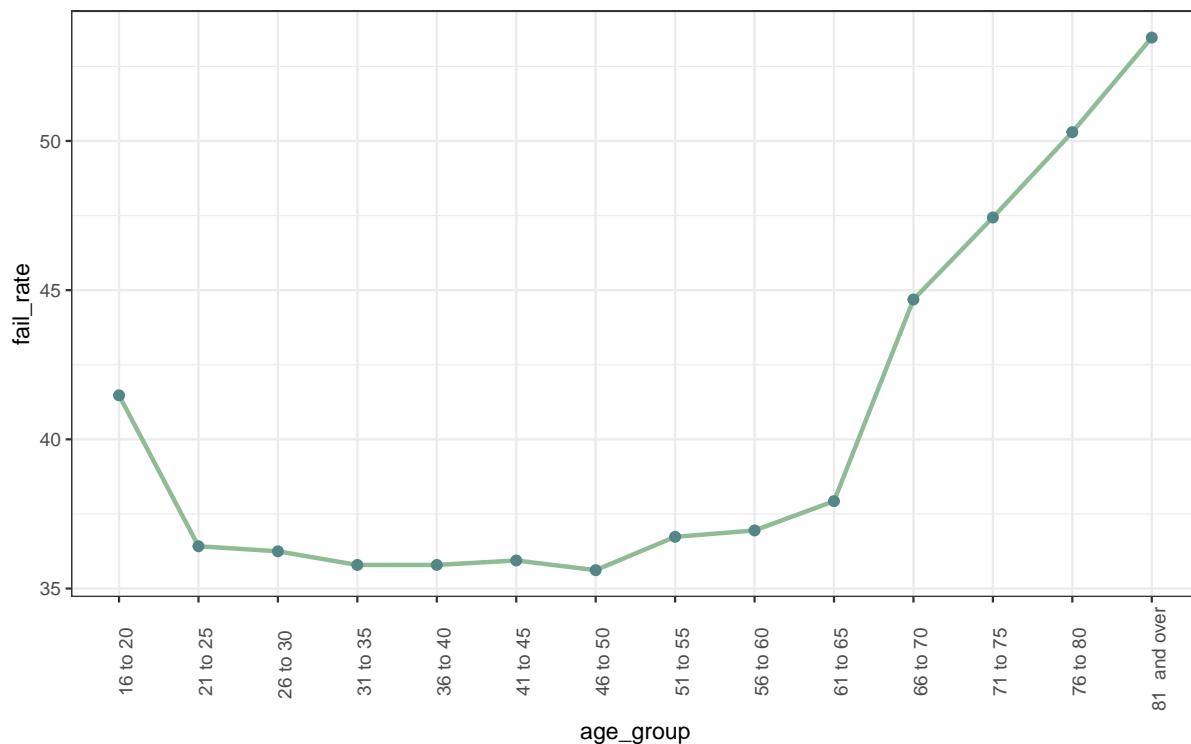
**Figure 4:** Queensland driving test fail rates by age

Figure 4, describes the failing rate of different age groups. It can be seen that the fail rate is increasing with the age grows older. Because people is 81 years old and over has the highest fail rate, which means it is hard for people to pass the driving license after 61 years old. However, there is one interesting point for young people with high rate at 41%. Basically, the people in this range takes the highest number of examinations. While in the original data set, some young people around these ages

have 200- or 300-times test, but still failed. Australia government has more restrictions on young people driving license, so the rate is high.

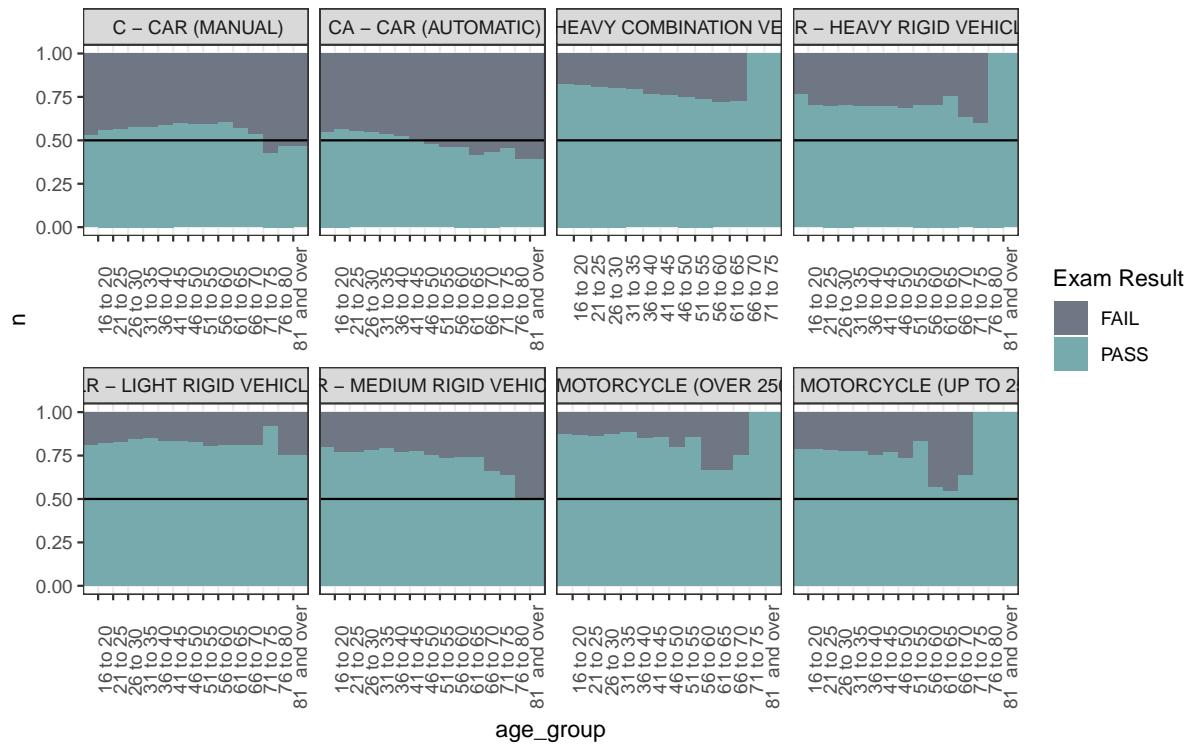


Figure 5: Compare the fail and pass in different license

In Figure 5, for most drive license, the number of pass all exceeds 50% of all age, except the automatic car license. People who fails at an older age. The number of fails is much more than pass. Another interesting point is that in motorcycle and heavy vehicle, people over 70 years old get 100% pass rate. This is mainly because there are only one or two people join the test and he pass. So, the pass rate is 100%. This doesn't mean all old people can get the license for one time.

Step 3