UNIVERSITI TEKNOLOGI MALAYSIA

PROBABILITY AND STATICTICAL DATA ANALYSIS

(SECI 2143)

SECTION 09

DR AZURAH AS

PROJECT 1: WHICH IS BETTER?; ELECTRONIC CAR VS GAS CAR

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1. Introduction and background

In this era, personal transportation had become something necessary for human that believed to be owned by most of the people around this world. Because of that, world's developed technology had invented an electronic powered vehicle which is said to be a way more convenient and eco-friendly than the normal vehicle. However, there are many aspect that need to be considered before we normalized the usage of this electronic vehicle. In this project we are assigned to conducted a survey with the topic "which is better? Electronic vehicle or gas vehicle". The main purpose of this project is to study on advantages and disadvantages between the both type of vehicle and people's preference toward them. Therefore, this investigation is to determined the potential of the usage of the electronic vehicle in the future.

2. Data collection

This survey aimed to receive responses from students and workers. This online survey also was conducted via Google Form. 62 responses had been received. There are 12 question asked in the google form which included gender, age, occupation, price comparison, fuel comparison, pollution scale, tendency of recommendation, type of owned vehicle, current vehicle maintenance cost and monthly income.

The data collected then were extracted into excel and imported to R studio software. We are using R programming language to analyze, conclude and present the data in graphical forms which is dot plot, bar chart, histogram, frequency distribution, pie chart, scatter plot and stem-leaf plot.

Below these are the scale that we used in our data analysis;

Nominal

- Gender : (male/female)
- Occupation : (student/worker)
- Vehicle cost (more affordable) : (electric car/gas car)
- Fuel cost (more affordable) : (electric car/gas car)
- Current vehicle : (electric car/gas car)

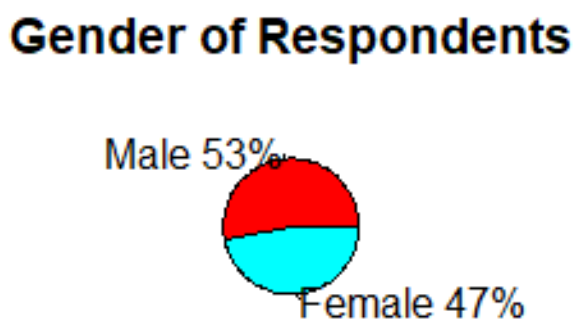
ordinal

- Gas/electric car pollution : (1-not polluting to 5-very polluting)
- Gas/electric car recommendation tendency : (1-very unlikely to 5-very likely)

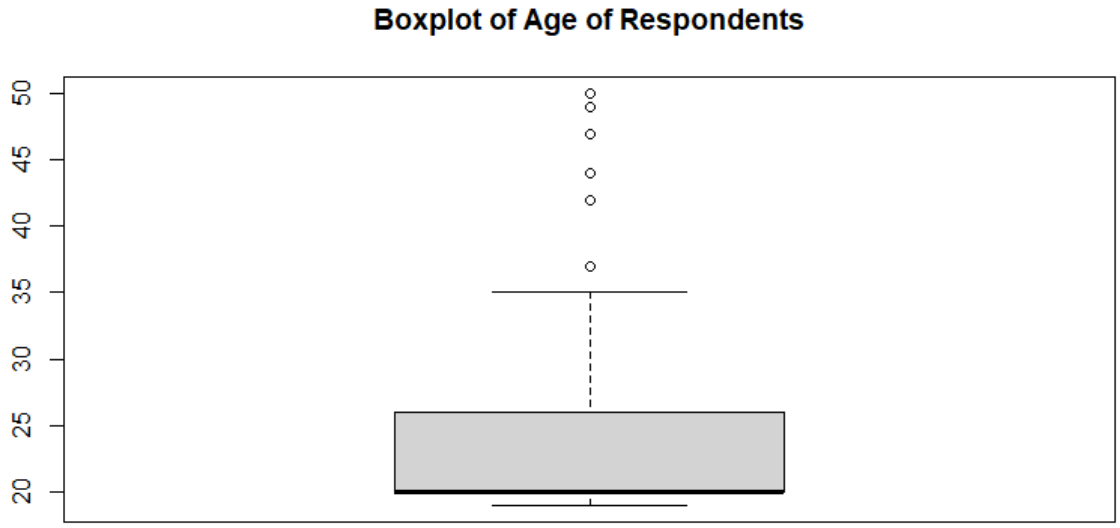
ratio

- age : (metric value)
- monthly maintenance expenses : (range value)
- monthly income : (range value)

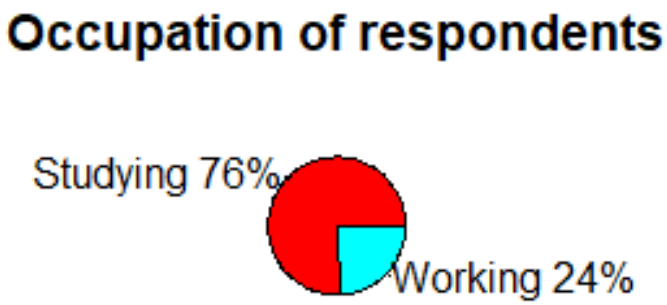
3. data analysis



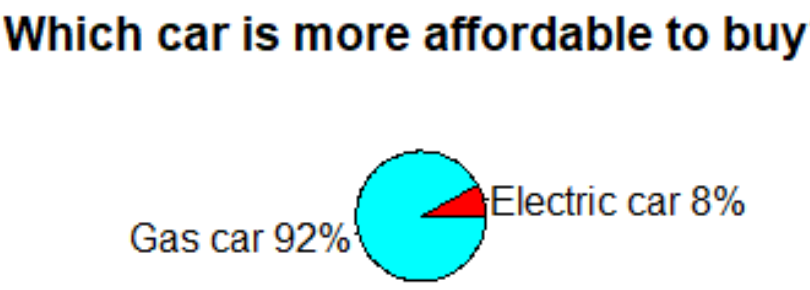
The pie chart above shows that among 60 respondents in this survey. The majority of the respondents are males in which there are 53% male respondents (33 male respondents). Also, there are 47% of female respondents(29 female respondents).



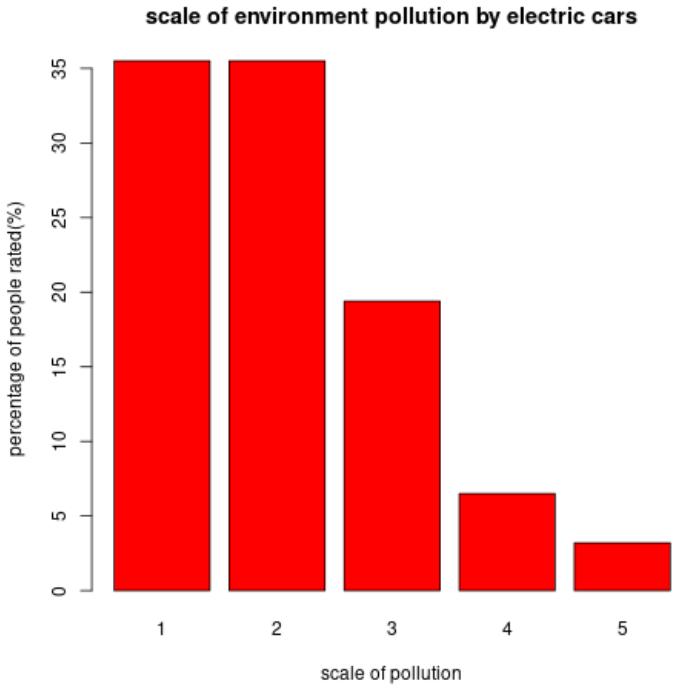
The boxplot above shows the age of respondents. From the boxplot, we know that first quartile and median are the same with the age of 20 while the third quartile is age of 26. The youngest respondent is 19 years old while the oldest respondent is 50 years old. The data distribution is positively skewed. Hence, it is clear that most of our respondents are 20 years old with frequency of 38.



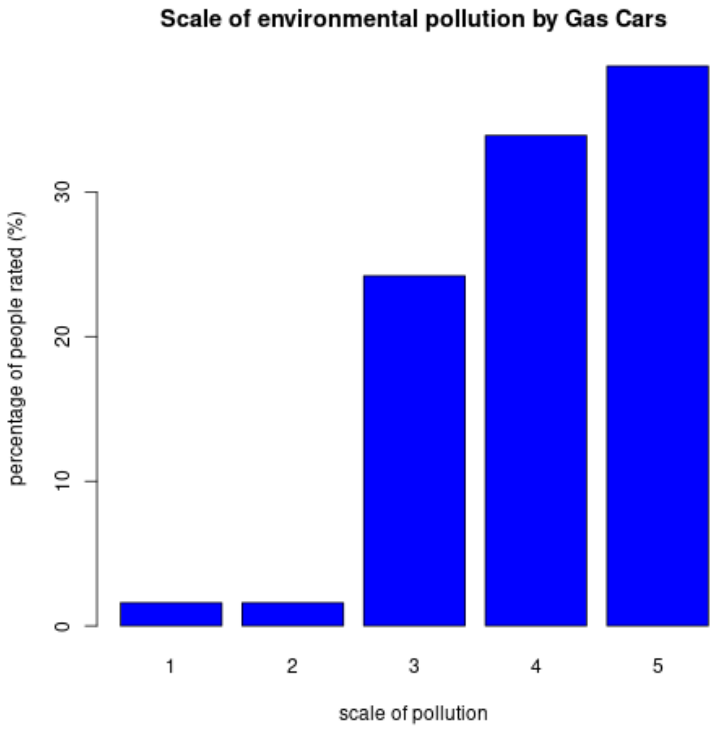
The pie chart depicts the percentage of occupation of respondents. Only 15 from 62 respondents are working. The percentage of occupation for respondents who are working is 24%. 47 of 62 respondents are currently studying. The percentage of occupation of respondents who are studying is 76%.



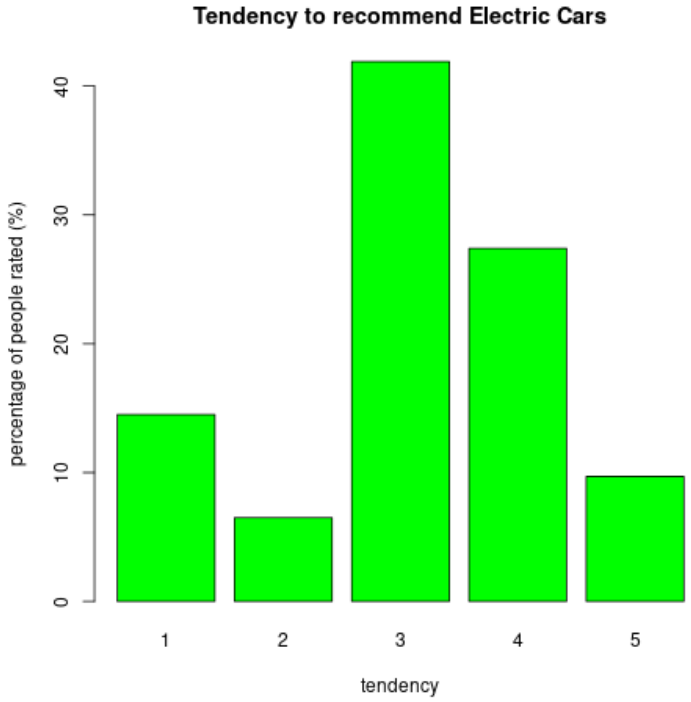
respondents. According to 57 of 62 respondents which is 92% of the total respondents stated that gas car is more affordable than electric car. 5 of 62 respondents which is 8% of total respondents stated that electric car is more affordable than gas car. The percentage of respondents who have stated gas car is more affordable is higher than the percentage of respondents who have stated electric car is more affordable.



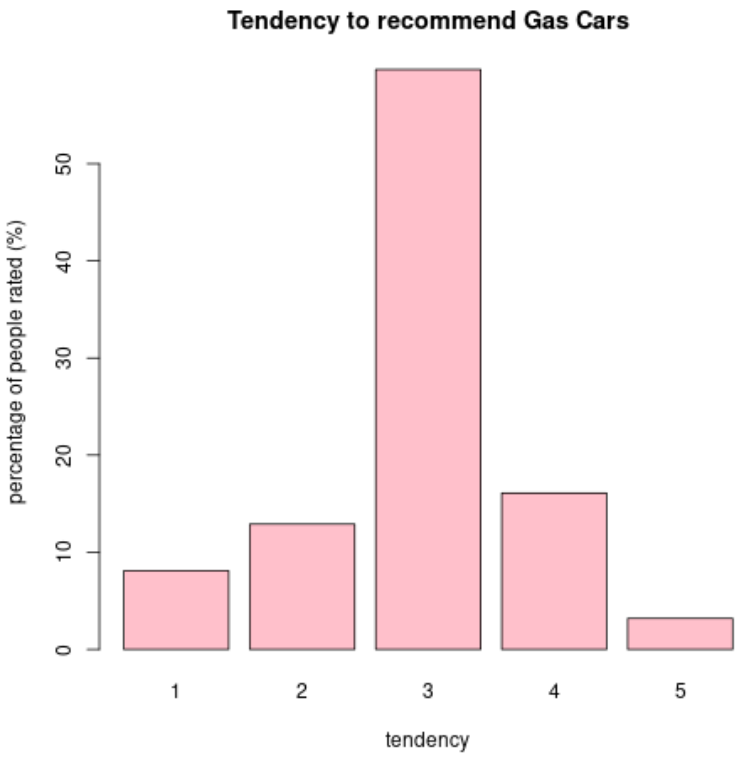
The bar graph above shows rate of environmental pollution caused by electric car where '1' represent not polluting and '5' represent vey polluting. Most people had rated for '1' and '2' which is 22 people (35.5%) followed by 12 (19.4%) people rated '3' while there are 4 (6.5%) people rated for '4'. And there are least people rated for '5' which is only 2 (3.2%) people. Based on this bar graph we can say that electric car are not polluting the environment so much and its proven that electric car are eco-friendly.



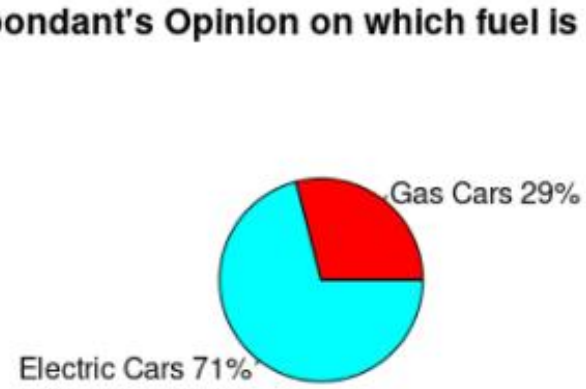
The bar graph above shows rate of environmental pollution caused by gas car where ‘1’ represent not polluting and ‘5’ represent vey polluting. Most people had rated for ’5’ which is 24 people (38.7%) followed by 21 (33.9%) people rated ‘4’ while there are 15 (24.2%) people rated for ‘3’. Besides that there are least people rated for ‘1’ and ‘2’ which is only 1 (1.6%) people. Based on this bar graph we can conclude that most of gas car can bring disaster to our environment.



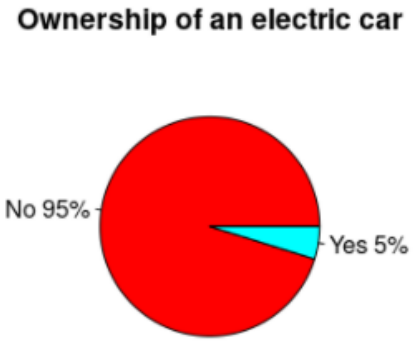
This bar graph shows the tendency of people in recommending electric car. Scale ‘1’ represent ‘very likely’ while scale ‘5’ represent ‘very unlikely’. The scale shows that the rate of people tendency in recommending electric car are in the middle (scale ‘3’ with 26 people (41.9%)) which we can considered as neutral. Followed by 17 people rated for ‘4’ (27.4%). Besides that there 6 (9.7%) people are not recommending electric car (scale ‘5’). While in the other hand, 9 (14.5%) people are truly recommending electric car (scale ‘1’) and there least people rated for ‘2’ which is only 4 people (6.5%). Form this bar graph, we can find that most of people are still satisfied with both type of vehicle.



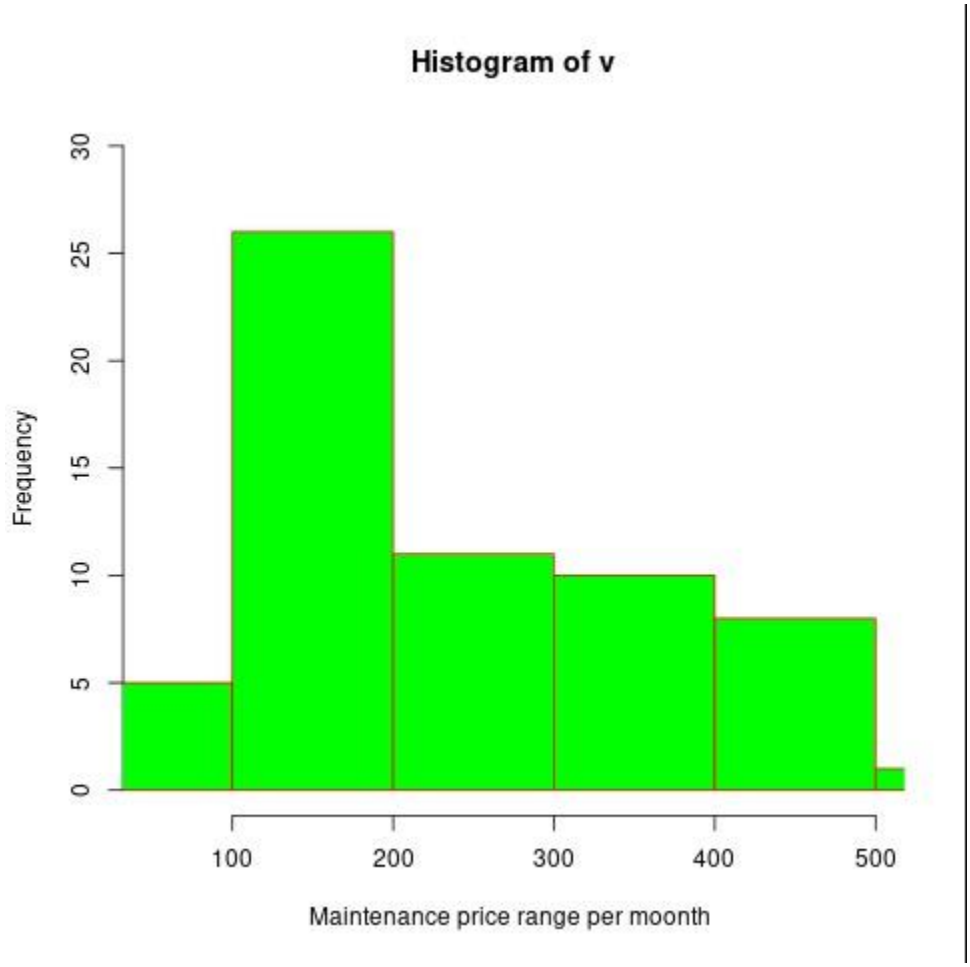
This bar graph shows the tendency of people in recommending gas car. Which scale ‘1’ represent ‘very likely’ while scale ‘5’ represent ‘very unlikely’. The scale shows that the rate of people tendency in recommending gas car are in the middle (scale ‘3’ with 37 people (59.7%)) which we can considered as neutral. Followed by 10 people rated for ‘4’ (16.1%). Besides that there are only 2 (3.2%) people are not likely to recommending gas car (scale ‘5’). While in the other hand, 5 (8.1%) people are recommending gas car (scale ‘1’) and there are people rated for ‘2’ which is 8 people (12.9%). Form this bar graph, we can find that most of people are still comfortable with both electric car and gas car.



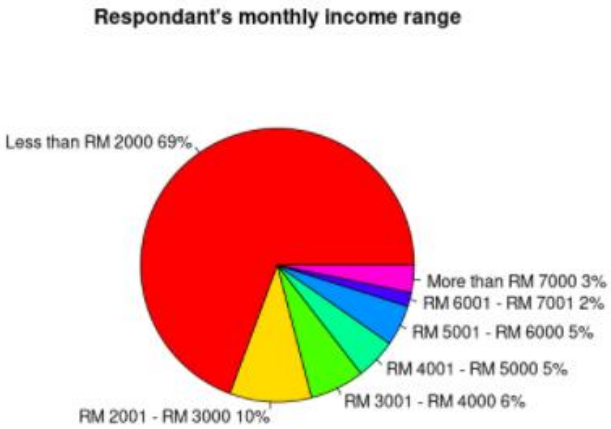
Pie chart above portrays the awareness of 62 respondents' opinion on which car fuel is cheaper. As we all are informed, fuel for electric cars is far cheaper and more efficient compared to regular gas cars fuel. Generally, most people knew that electric cars offer cheaper alternative fuel with higher percentage of choice (71%) compared to gas cars (29%). The result shows that electric cars has cheaper fuel than gas cars.



This pie chart depicts the percentage of respondents' ownership on an electric car. Only 3 from 62 respondents owns an electric car. The percentages are quite low for "Yes" (5%) while others that does not own an electric car have higher percentage (95%).



As for current car maintenance cost, the mode is at RM 100 - RM200 per month with 27 respondents. The second highest chosen option is RM 201 – RM 300 per month with 12 respondents. The third highest chosen option is RM 301 – RM 400 per month with 9 respondents. The third least option chosen is RM 401 – RM 500 per month with 8 respondents. The second least chosen option is Less than RM 100 per month with only 5 respondents and lastly only 1 respondent paid more than RM500 per month for their car's maintenance.



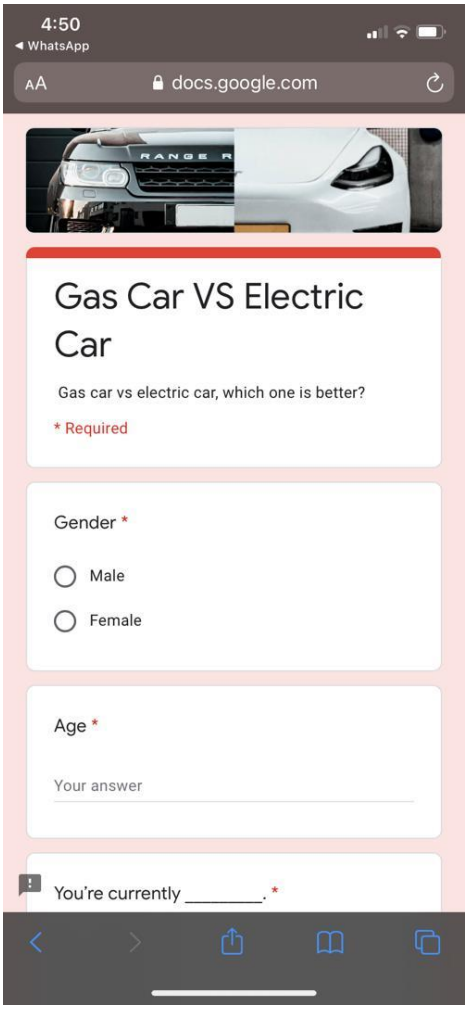
After we are done sharing the forms, we found out that most respondents have monthly income of lower than RM 2000. This is a result in higher number of responses that came from students. There is a large amount (43) of respondents with monthly income of lower than RM 2000. Next up, the second highest option chosen is RM 2001 – RM 3000 per month (6 Respondents). Then, the third highest option chosen is RM 3001 – RM 4000 per month (4 Respondents). As for monthly income of RM 4001 – RM 5000 per month and RM 5001 – RM 6000 per month, both has the same number of respondents (3 Respondents each). Surprisingly, respondents with monthly income that is more than RM 7000 (2 Respondants) is more than respondents with monthly income of RM 6001 – RM 7000 per month(1 Respondant).

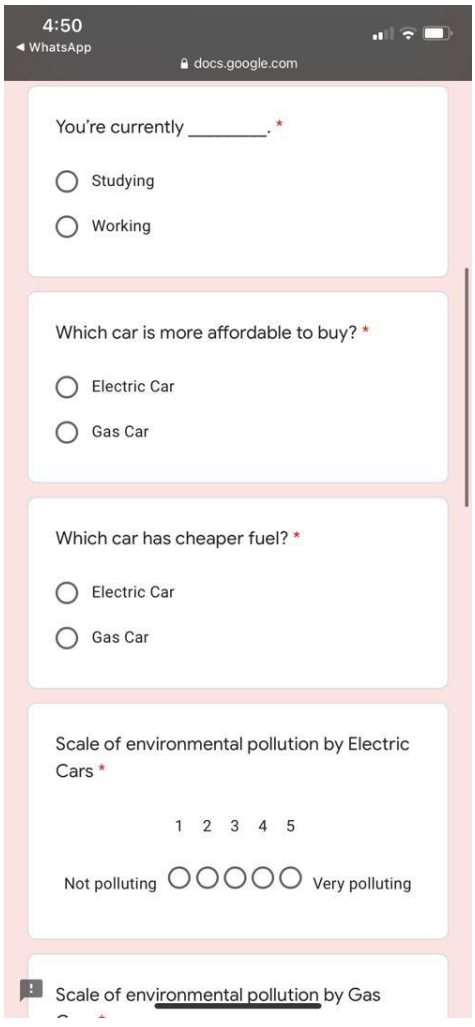
4. **conclusion**

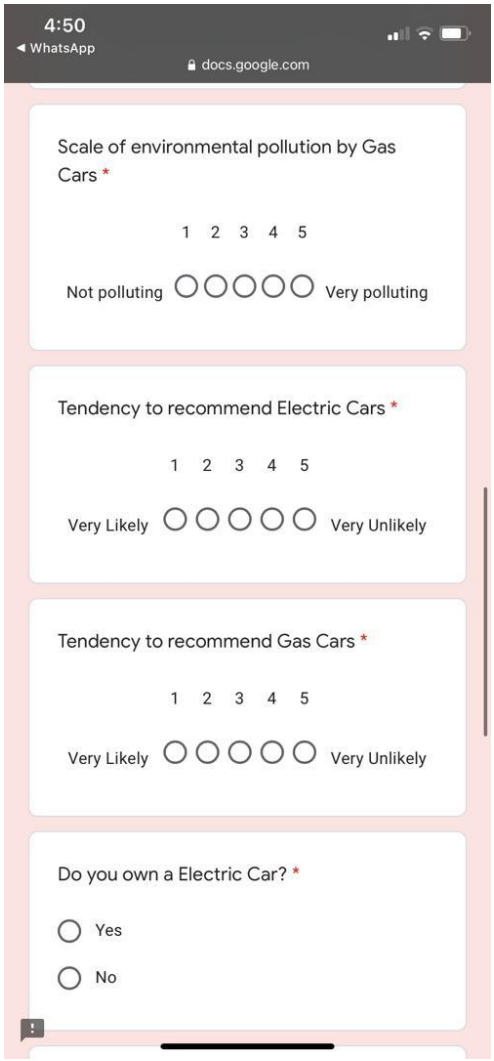
In a nutshell, we found that electric cars are more favorable compared to gas cars. People are starting to realize that gas cars are not as efficient as electric cars. Even with higher cost in buying it at the first place, maintenance price of electric car is far less since there is no need to change any fluids or liquids. Pollution also can be reduced since electric cars does not emit any harmful gases compared to normal gas cars. Malaysians need to know the benefits of having electric cars, only then they will all buy electric car because it is for a better future for all including the buyer. During this project, our group learned how to operate R language and create graphics such as pie chart, bar chart, histogram, and boxplots. We've also gathered enough information to know that Malaysians knew that electric cars is better than gas cars.

Appendix

https://forms.gle/6Rv9W7hPPmt6XkGW9



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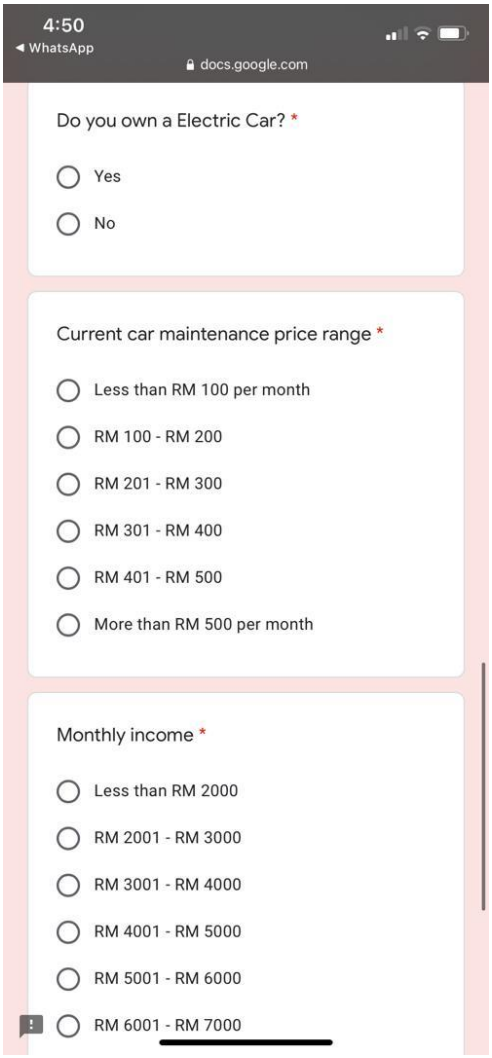
Scale of environmental pollution by Gas Cars *
1 2 3 4 5
Not polluting
Very polluting
Tendency to recommend Electric Cars *
1 2 3 4 5
Very Likely
Very Unlikely
Tendency to recommend Gas Cars *
1 2 3 4 5
Very Likely
Very Unlikely
Do you own a Electric Car? *
Yes
No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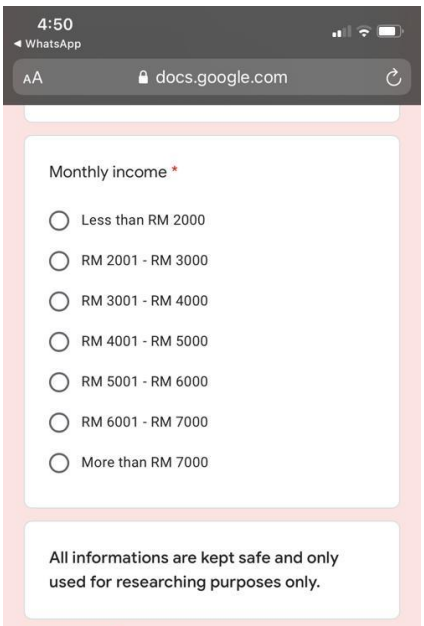
Do you own a Electric Car? *
Yes
No
Current car maintenance price range *
Less than RM 100 per month
RM 100 - RM 200
RM 201 - RM 300
RM 301 - RM 400
RM 401 - RM 500
More than RM 500 per month
Monthly income *
Less than RM 2000
RM 2001 - RM 3000
RM 3001 - RM 4000
RM 4001 - RM 5000
RM 5001 - RM 6000
RM 6001 - RM 7000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Monthly income *
Less than RM 2000
RM 2001 - RM 3000
RM 3001 - RM 4000
RM 4001 - RM 5000
RM 5001 - RM 6000
RM 6001 - RM 7000
More than RM 7000
All informations are kept safe and only used for researching purposes only.