Statistics

Mathematics (MATH 0103)

Assignment 2

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Content

Introduction

A survey is a systematic snapshot that is used to infer a larger whole. Surveys have been used throughout the years in a variety of forms. In this assignment, we will be using the survey to compare the expenses of the residents in Klang Valley and Malacca on their methods of transportation.

The data collected from the survey will be analysed, using the quantitative studies including bar charts, pie charts or graphs to examine the variables and consistency of personal or public transportation users in Klang Valley and Malacca.

Statistics means a quantitative data on any subject, especially data comparing the distribution of some quantities for different subclasses of the population. To ensure that the data collection is undertaken in a way that allows valid conclusions to be drawn, we have been put into groups that consist of four to five members with the purpose of collecting, organizing, presenting and drawing a conclusion for this statistical data.

On the other hand, data analysis is information organized for analysis or used to reason or make decisions. Data analysis has multiple sides and approaches, surrounding diverse techniques under a variety of names in different business, science and social science domains.

Objectives

There are three objectives to achieve in this assignment:

1. To apply the use of statistics in real life.
2. To study the expenses of Klang Valley and Malacca residents on cars.
3. To study the expenses of Klang Valley and Malacca residents who do not own cars on public transportation.
4. To study how much Klang Valley and Malacca residents who do not own a car and have intention to buy a car willing to spend in purchasing a car in the future.

Description of the Survey

The survey we did is for the people living (residents) in Klang Valley and Malacca to carry out the response from them to compare the difference between these two places base on the questions listed below:

1. Do you own a car?
2. If yes, how many cars do you own?
3. What car do you own?
4. What brand is your car?
5. How much did you spend in purchasing your car?
6. Did you get a loan for your car?
7. If yes, how much do you pay for your monthly instalment?
8. Did you modify your car?
9. If yes, how much did you spend in modifying your car?
10. How far is your driving distance?
11. How much do you spend on petrol per month?
12. How much do you spend on car maintenance?
13. If no, how much do you spend on transportations per month?
14. Do you intend to buy a car in the future?
15. If yes, how much do you intend to spend on the car?
16. What car do you intend to buy?
17. What brand do you intend to buy?

Purpose of the Survey

The purpose of our survey is to study the expenses on car of residents from two different geographical regions which are Malacca and Klang Valley. For those residents who own cars, we identified their spending behavior such as how much money they spent on purchasing their respective cars, expenses on petrol per month and their car maintenance fees. For those who modified their cars, we also identified how much they spent on modifying their cars.On the other hand, for those who do not own a car, we identified how much they spend on transportations.

Methodology

1. Malacca

From 25th to 27th October, Esther Lim, Tan Zi Cin, Lim Chong Min and Sharon Chow went to Malaccafor 3 days 2 nights for a study trip. During our stay there we conducted the survey at Aeon Malacca and Dataran Pahlawan. We approached Malacca residents at the malls and asked them to fill up our survey forms

Figure 1.0 Aeon Malacca

Figure 1.1&Figure 1.2 Dataran Pahlawan

2. Klang Valley

Teoh Hui Yu and Hong Sang Won couldn't make it with us to Malacca so they were in charge of conducting the surveys in the Klang Valley region. They conducted the survey in GM Klang and Sunway Pyramid. They conducted the surveys on 25th and 26th October.

Figure 1.3 Sunway Pyramid

Figure 1.4 GM Klang

BASIC

ANALYSIS

Do you own a car?

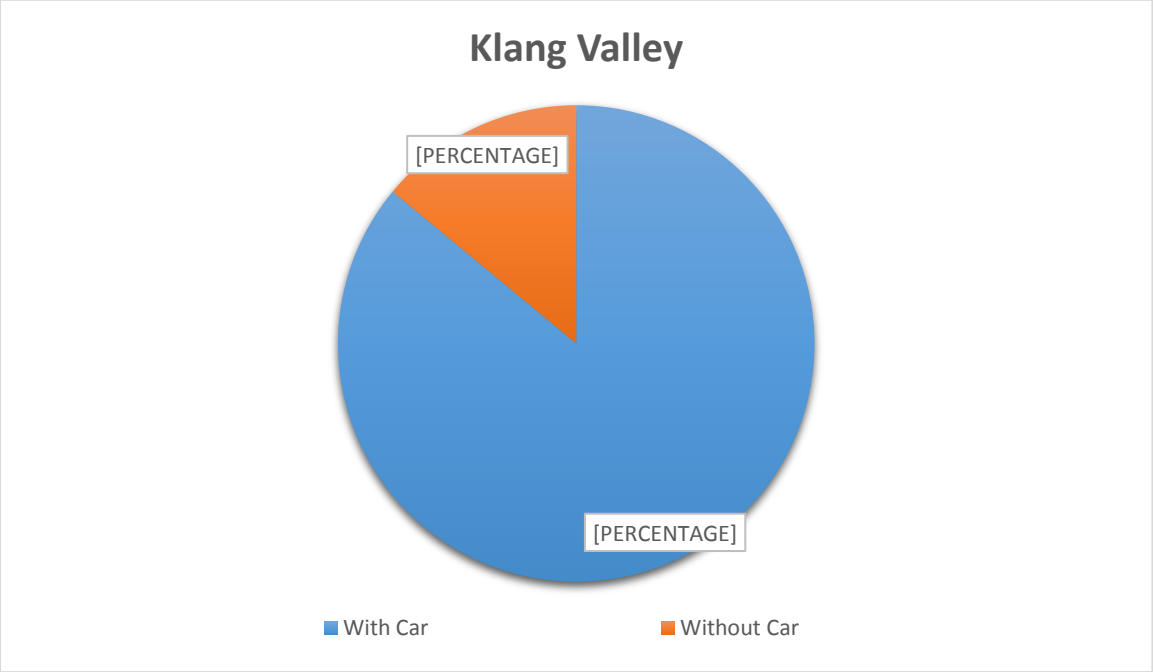

Figure 1.5

The figure above shows the number of survey participants who do and do not own cars in Klang Valley. 86% of the survey participants own cars and 14% of the participants do not own cars in Klang Valley.

Do you own a car?

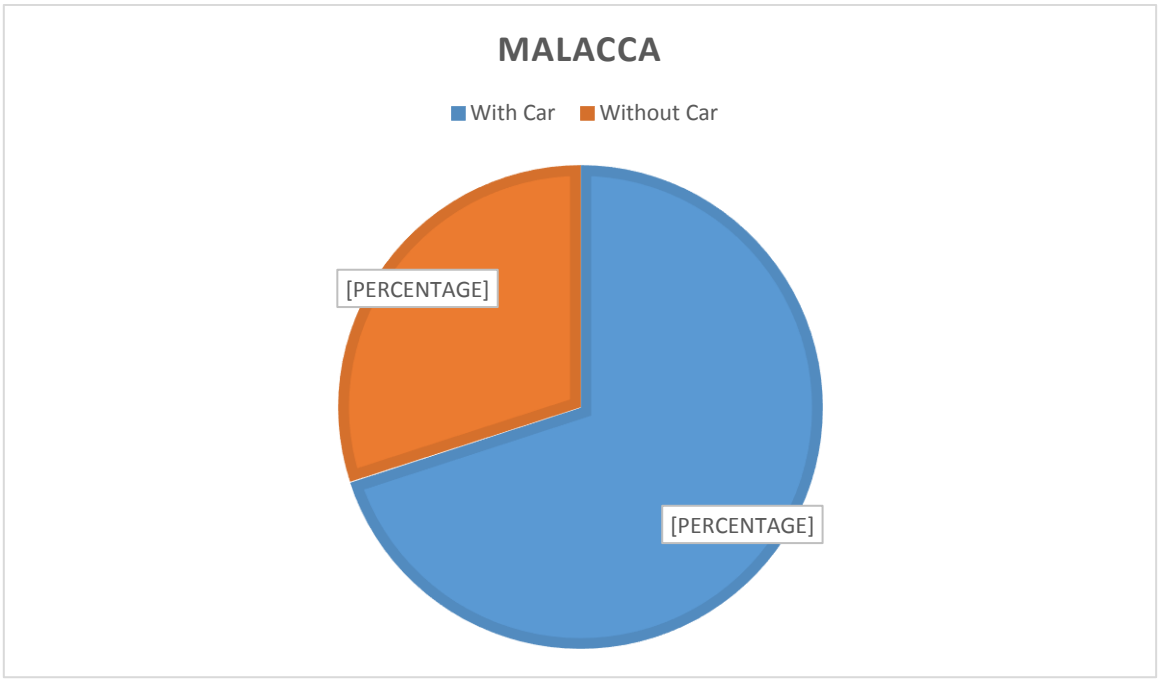

Figure 1.6

The figure above shows the number of Malacca residents that we have surveyed who owns cars and do not own cars. 70% of the Malacca residents that we surveyed own cars and 30% of them do now own cars.

If No, do you intend to buy a car in the future?

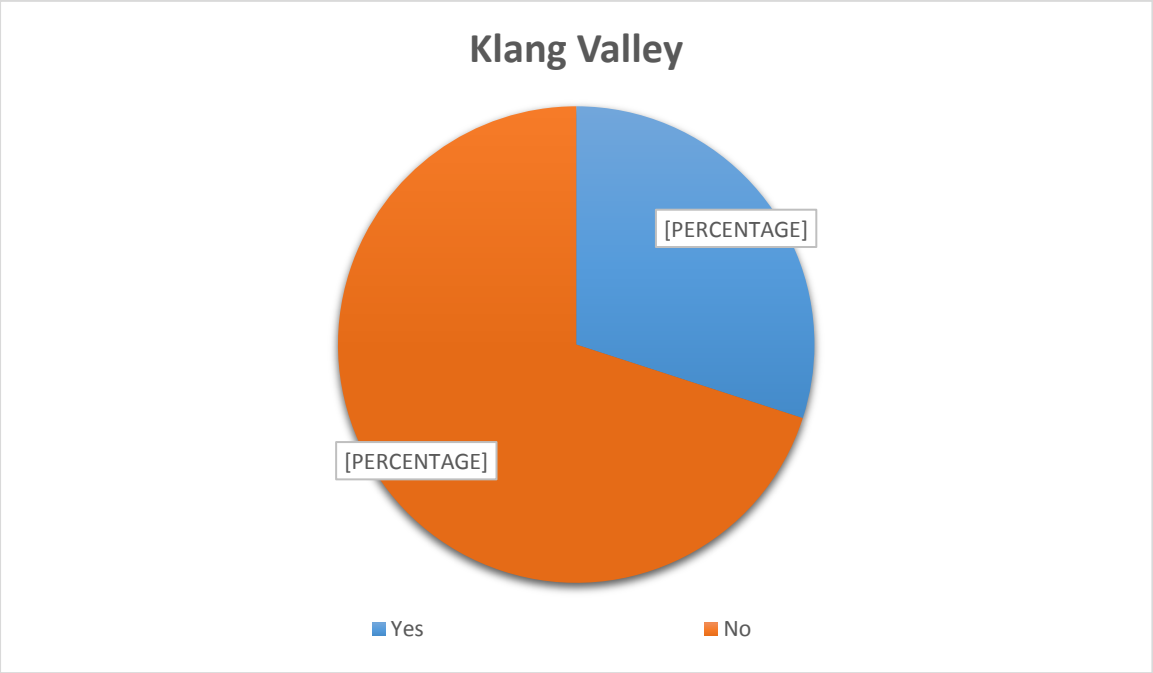

Figure 1.7

70% of the Klang Valley residents who do not own cars intend to buy a car in the future. 30% of them got no intention to buy car in the future.

If no do you intend to buy a car in the future?

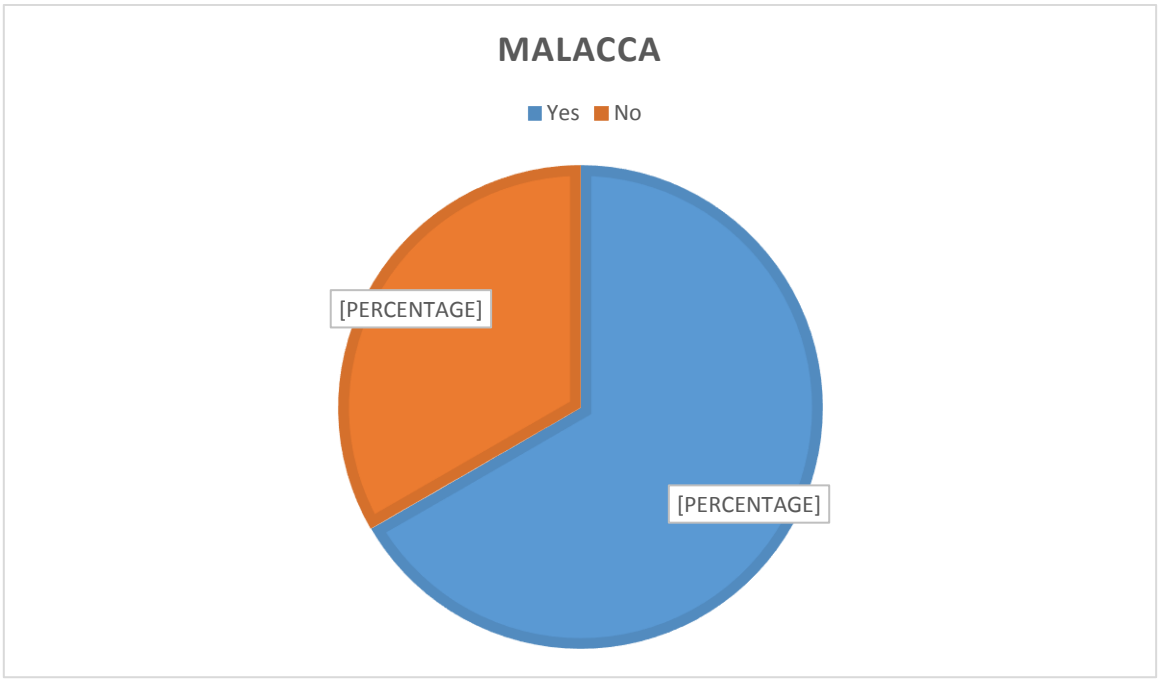

Figure 1.8

67% of the Malacca residents who do not own cars intend to buy a car in the future.

33% of them got no intentions to buy a car in the future.

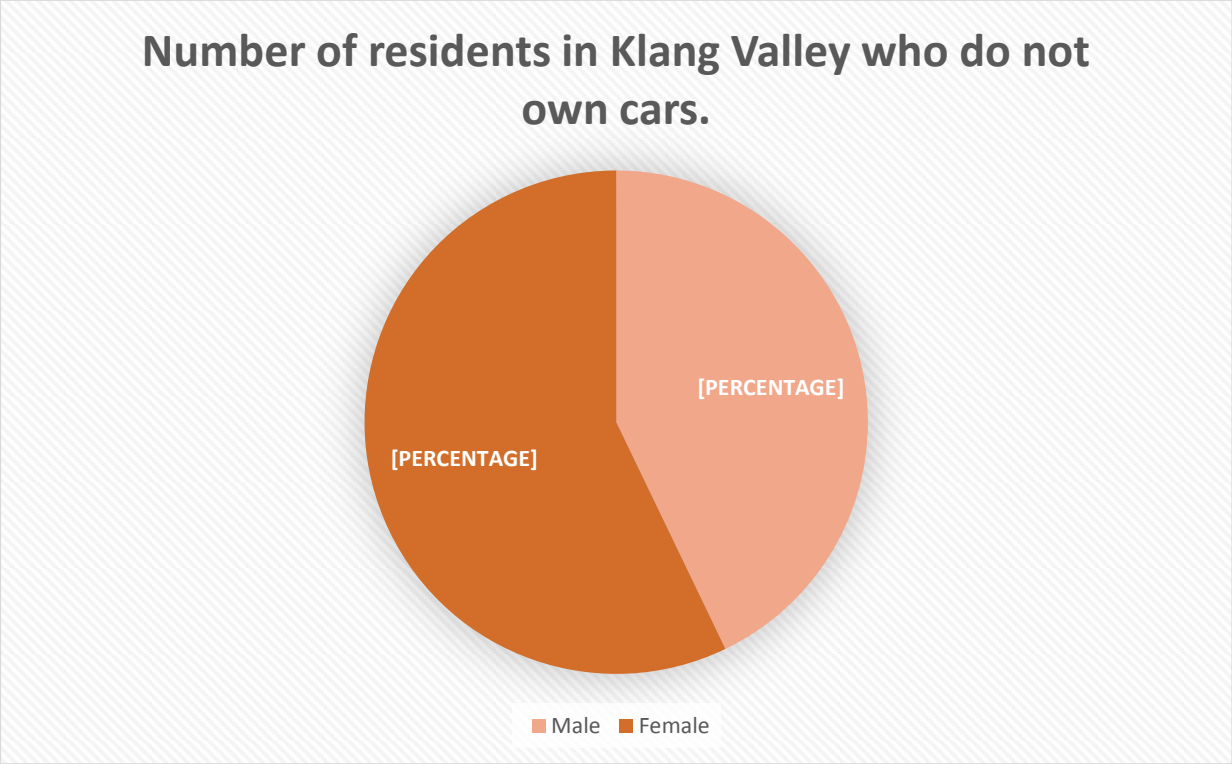

Figure 1.9

The figure above shows the number of residents in Klang Valley who do not own cars among a total of 50 survey participants. There is a total of 7 survey participants who do not own cars. 3 of the residents are male and 4 of the residents are female.

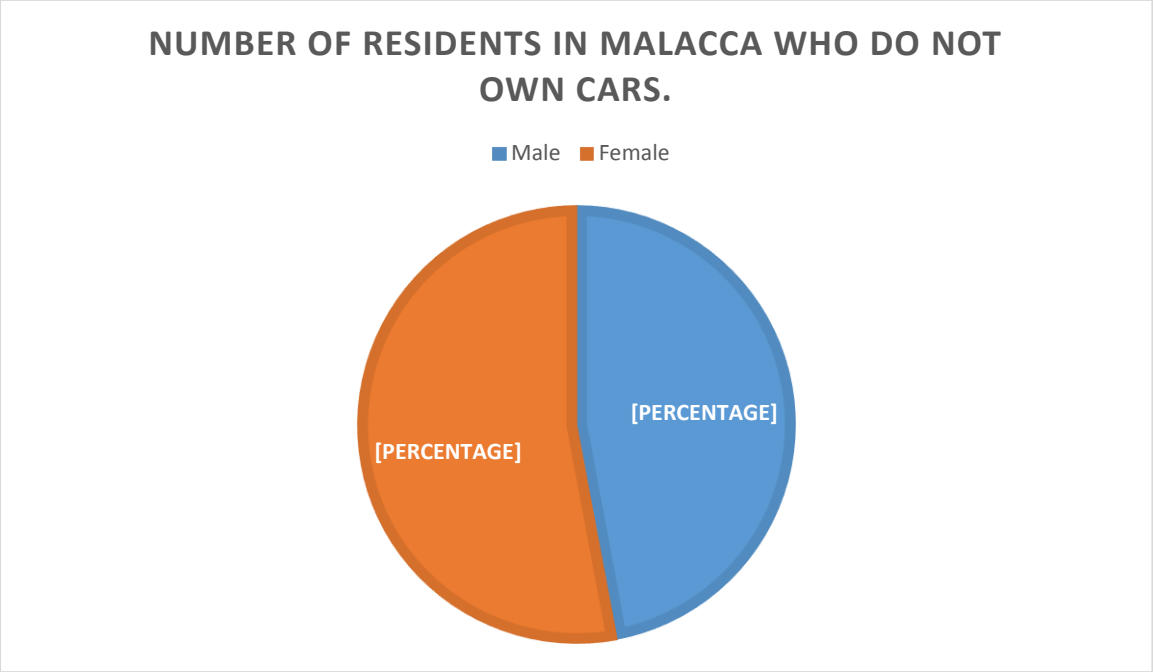

Figure 2.0

The figure above shows the number of residents who do not own cars in Malacca among a total of 50 survey participants. There a total of 17 survey participants who do not own cars. 8 of them are male while 9 of them are female residents.

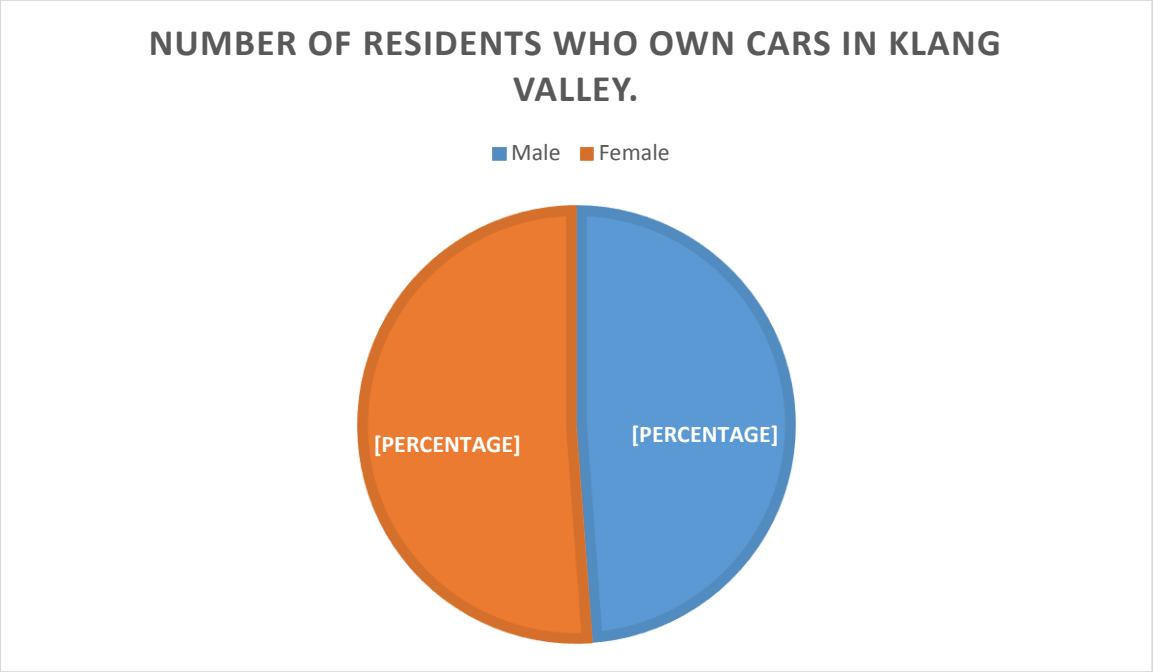

Figure 2.1

The figure above shows the number of residents who own cars in Klang Valley among 50 survey participants. There are a total of 43 survey participants who own cars in Klang Valley. 21 of them are male residents and 22 of them are female residents.

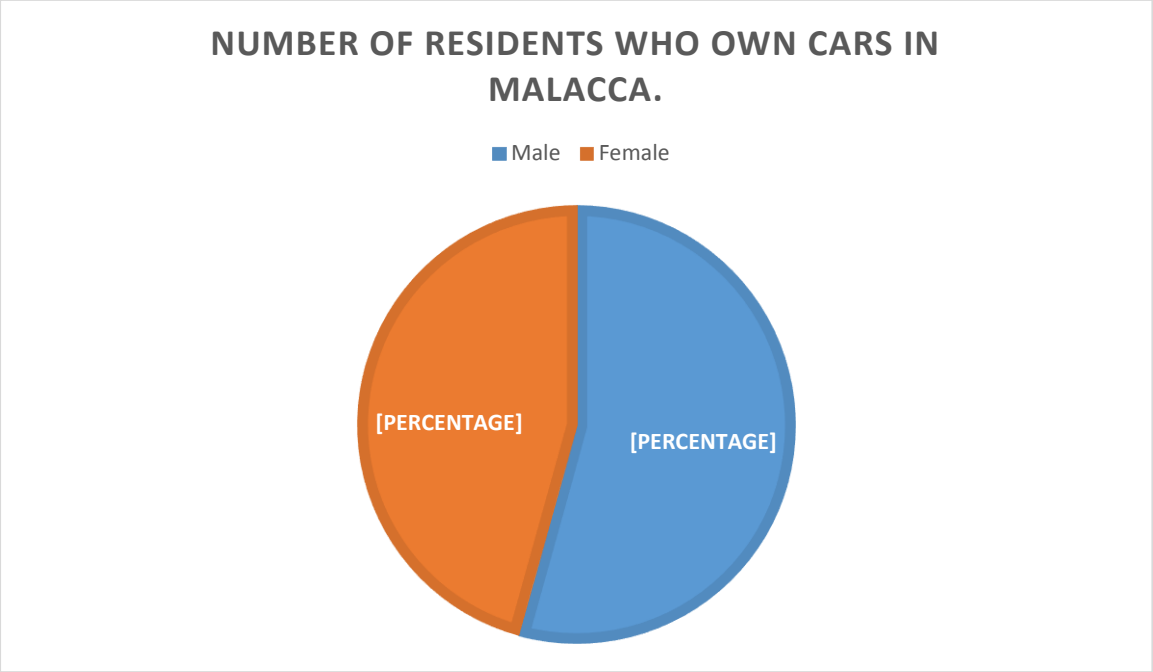

Figure 2.2

The figure above shows the number of residents who own cars in Malacca among a total of 50 survey participants. There are a total of 35 participants who own cars. 19 of them are male and 16 of them are female residents.

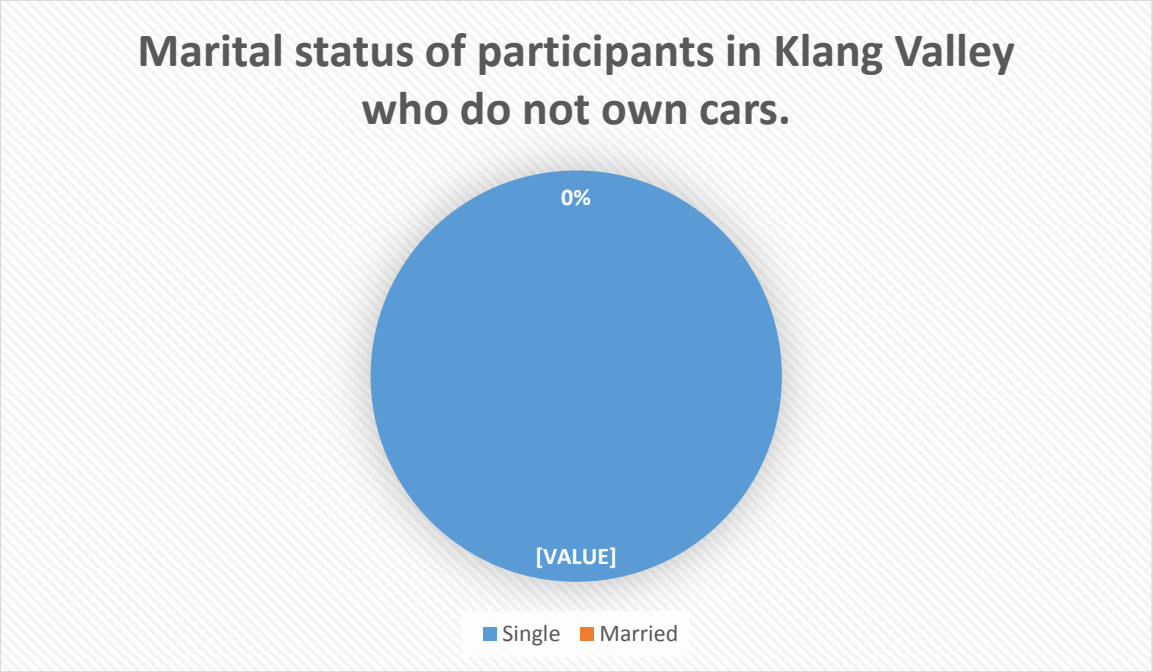

Figure 2.3

The figure above shows the marital status among the participants who are residents in Klang Valley who do not own cars. 7 of the participants are single and 0 of the participants are married.

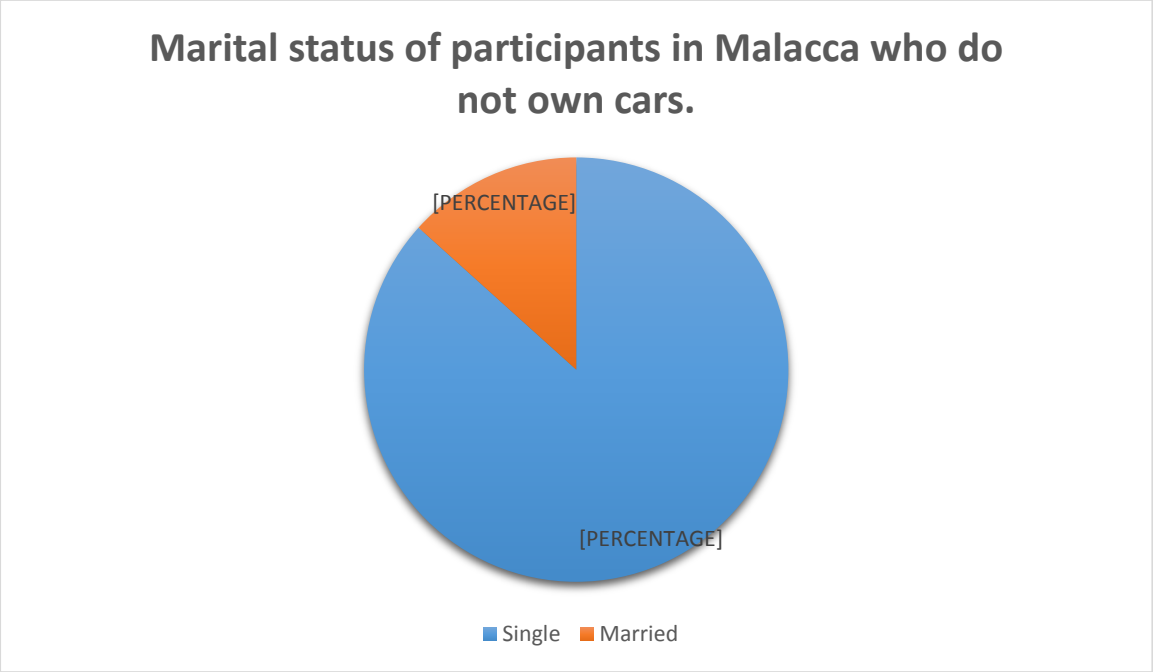

Figure 2.4

The figure above shows the marital status among the participants who are residents in Klang Valley who do not own cars. 13 of the participants are single and 2 of the participants are married.

What brand is your car?

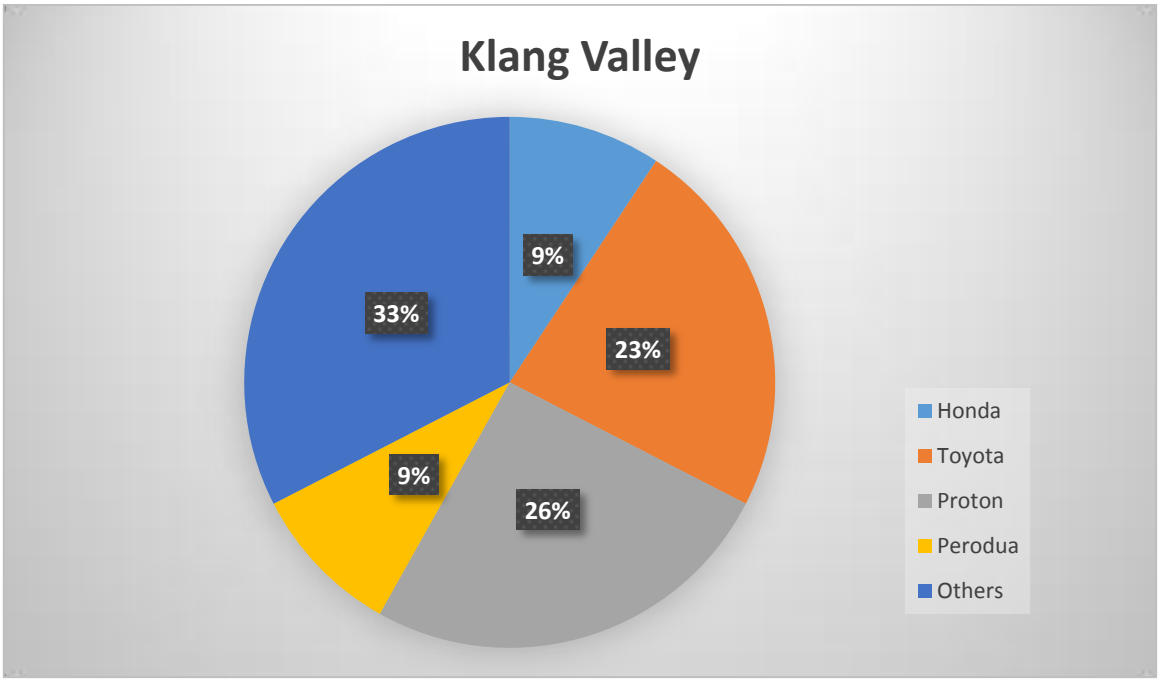

Figure 2.5

According to the pie chart above 33% of the Klang Valley residents we surveyed own Honda cars, 26% own Proton cars, 23% own Toyota cars, 9% own Perodua cars and 9% own other brands.

What brand is your car?

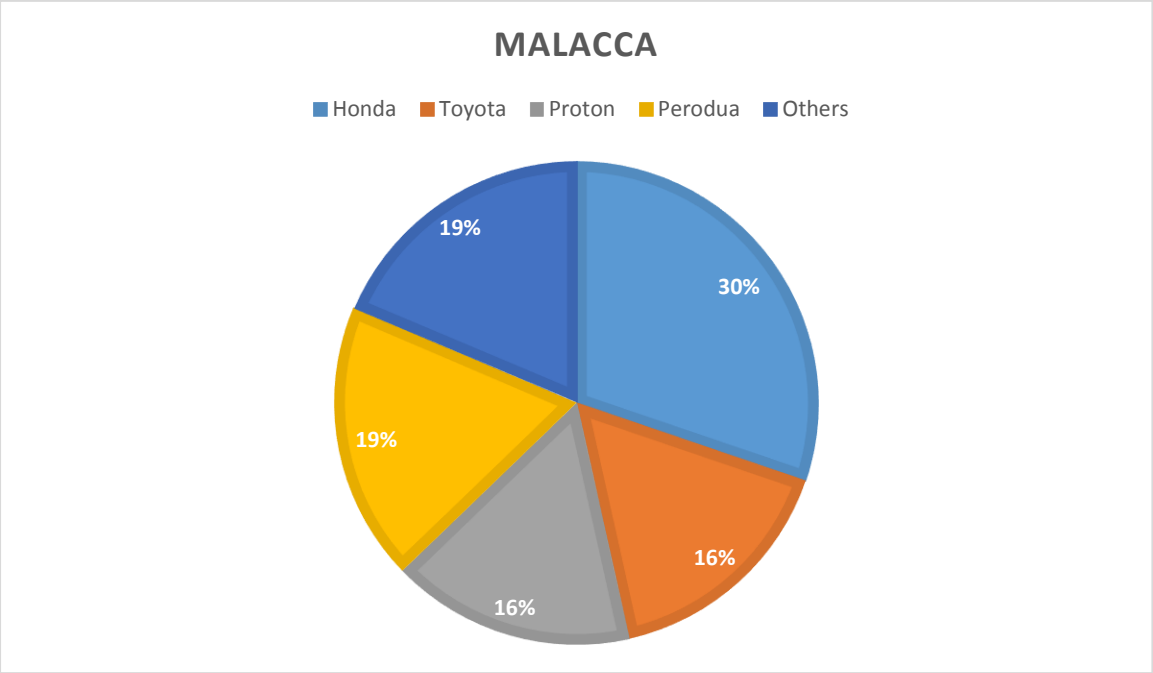

Figure 2.6

According to the pie chart above, 30% of the Malacca residents that we surveyed own Honda cars, 16% own Toyota cars, 19% own Perodua cars and 19% own other brands.

Did you get a loan for your car?

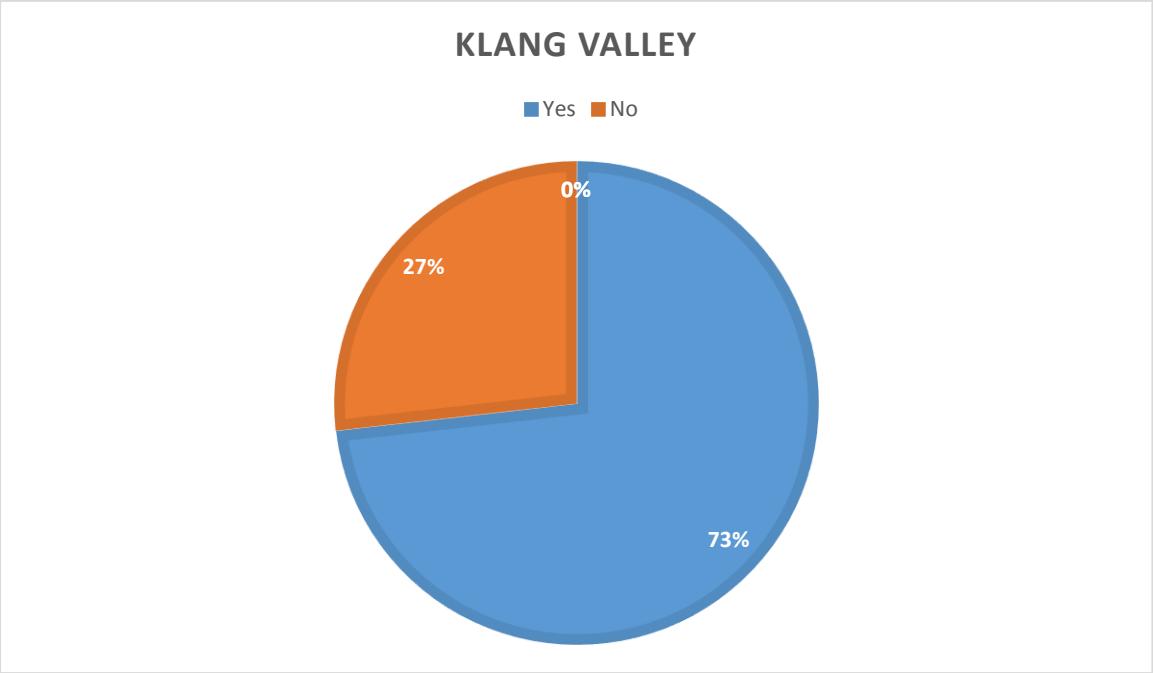

Figure 2.7

According to the pie chart above, 40 out of 43 which is equivalent to 73% of the Klang Valley residents we surveyed who own cars got a loan for their car. 27%of them didn't get a loan.

Did you get a loan for your car?

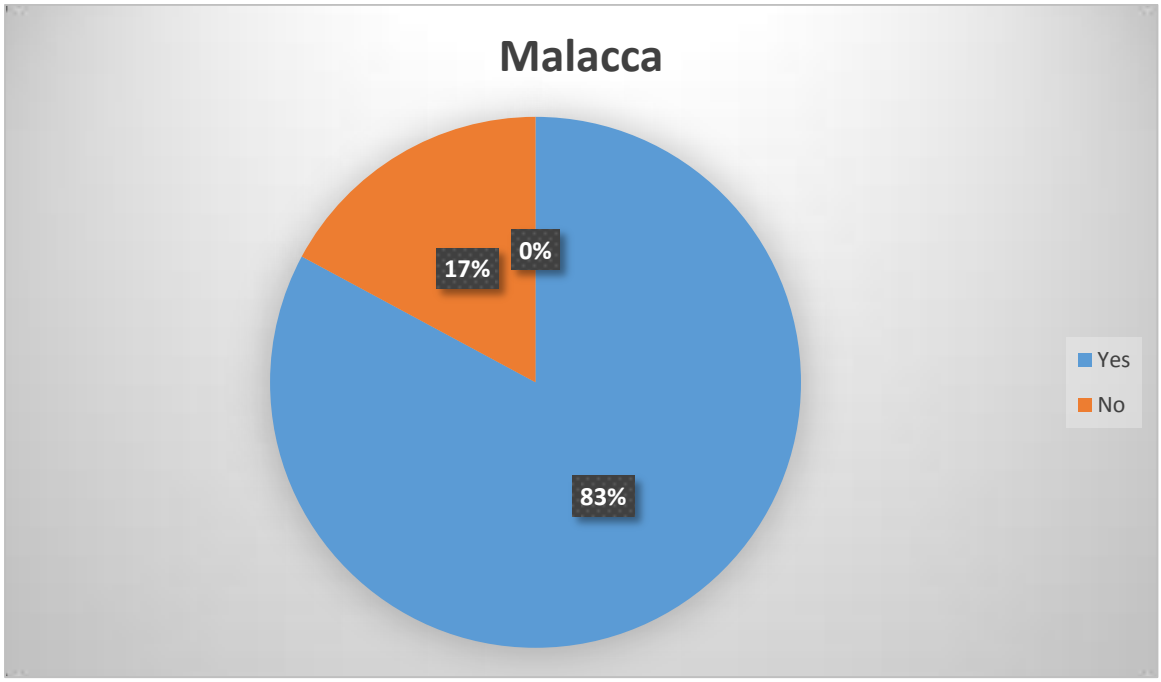

Figure2.8

According to the pie chart above, 29 out of 35 of which is equivalent to 90% of the Malacca residents we surveyed own cars got a loan for their car. 10% of them didn't get a loan.

What kind of car do you own?

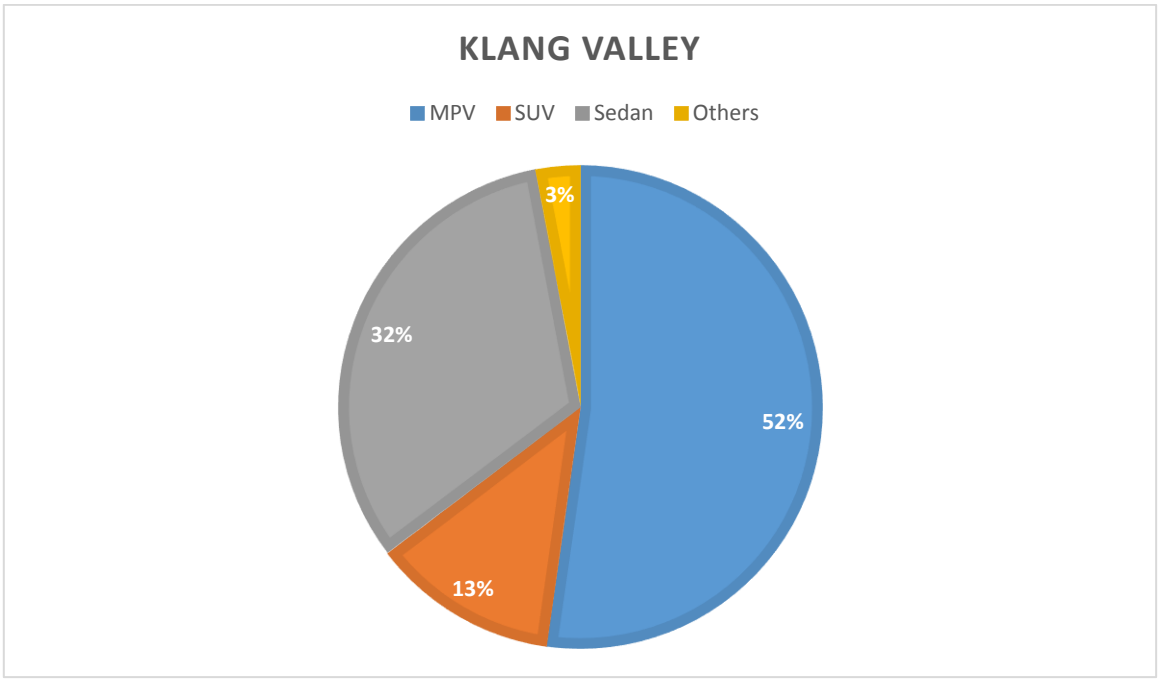

Figure 2.9

According to the pie chart above, 52% of the Klang Valley residents we surveyed own MPV, 32% own sedan, 13% SUV, 3% own other kinds of car.

What kind of car do you own?

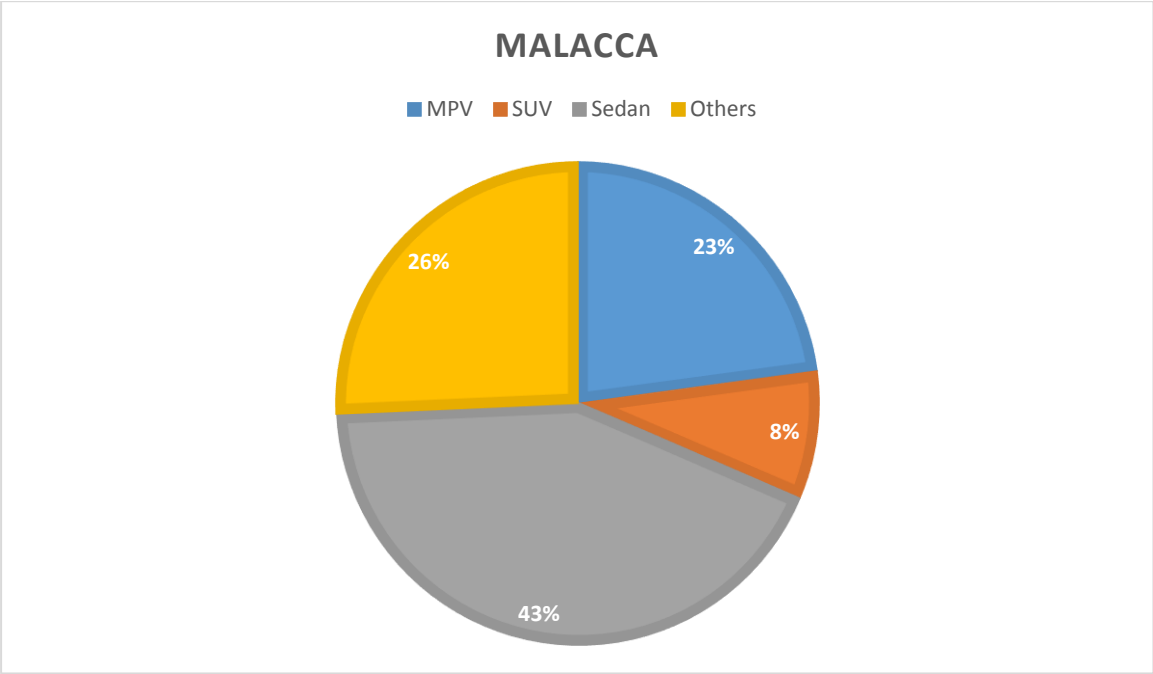

Figure 3.0

According to the pie chart above, 43% of the Malacca residents we surveyed own sedan, 8% own SUV, 23% own MPV, 8% own SUV and 26% own other types of cars.

How many cars do you own?

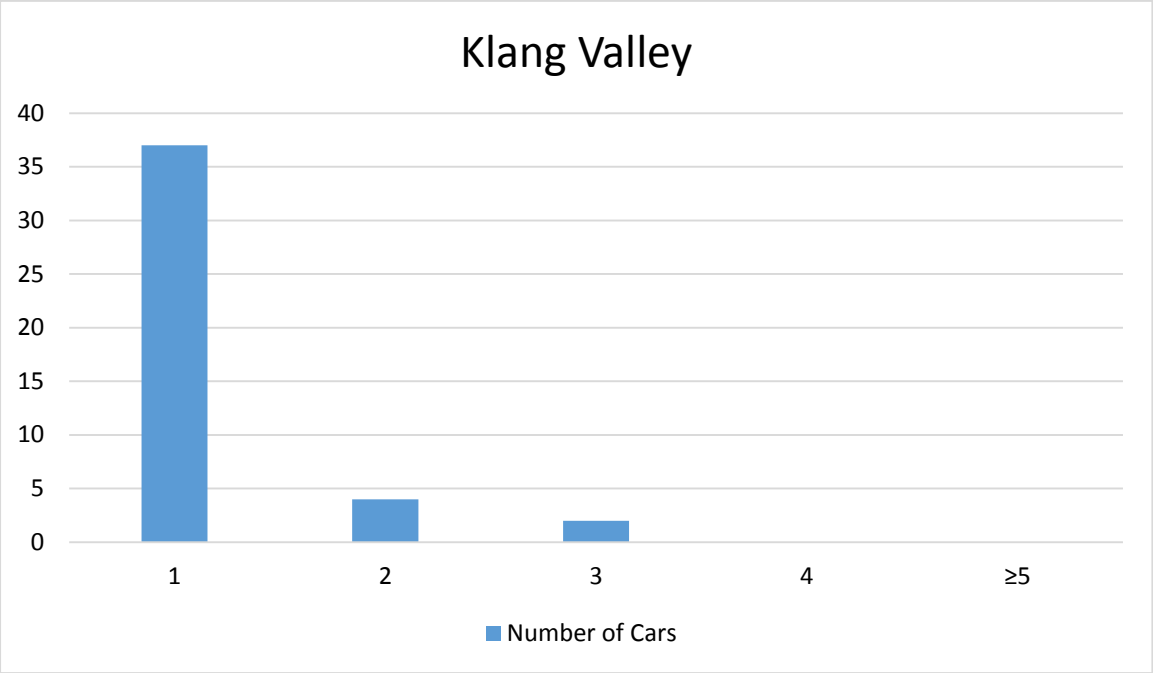

Figure 3.1

According to the bar chart above, the mode is 1. Majority of the Klang Valley residents that we surveyed own 1 car, followed by 2 cars and 3 cars. None of the Klang Valley residents that we surveyed own 4 cars and ≥5 cars.

Number of cars,x	**f**	**F**	**fx**	**fx^2**
1	37	37	37	37
2	2	39	4	8
3	2	41	6	18
4	0	41	0	0
≥ 5	0	41	0	0
	$\Sigma f=43$		$\Sigma fx=47$	$\Sigma fx^2=63$

Mean $= \frac{\sum fx}{\sum f}$

$= \frac{47}{43}$

= **1.09**

Mode = **1**

Median =**1**

Q_1= **1**

Q_3= **1**

Variance $= \frac{\sum fx^2}{\sum f} - (\bar{x})^2$

$= \frac{63}{43} - (1.09)^2$

= **0.28**

Standard Deviation $= \sqrt{Variance}$

$= \sqrt{0.28}$

=**0.53**

Interquartile Range $= Q_3 - Q_1$

= 1 - 1

= **0**

How many cars do you own?

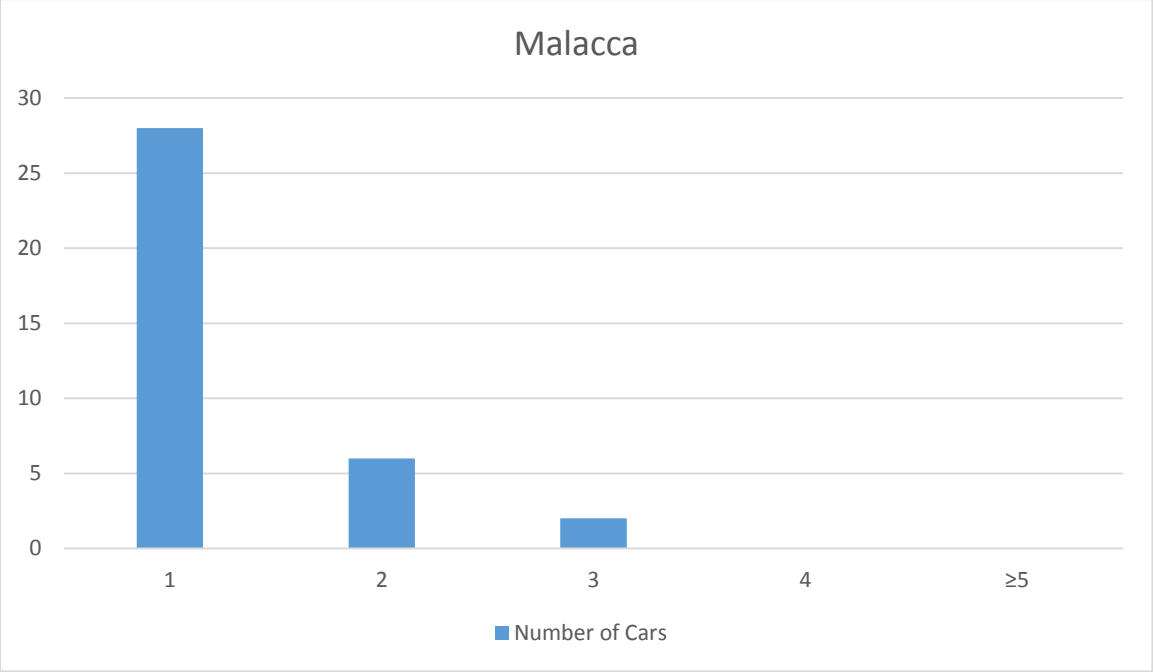

Figure 3.2

According to the bar chart above, the mode is 1. Majority of the Malacca residents that we surveyed own 1 car, followed by 2 cars and 3 cars. None of the Malacca residents that we surveyed own 4 cars and ≥5 cars.

Number of cars,x	**f**	**F**	**fx**	**fx²**
1	28	28	28	28
2	6	34	12	24
3	1	35	3	9
4	0	35	0	0
≥ 5	0	35	0	0
	Σf=35		Σfx=43	Σfx²=61

Mean $= \frac{\Sigma fx}{\Sigma f}$

$= \frac{43}{35}$

= **1.23**

Mode = **1**

Median =**1**

Q_1**= 1**

Q_3= **2**

Variance $= \frac{\Sigma fx^2}{\Sigma f} - (\bar{x})^2$

$= \frac{61}{35} - (1.23)^2$

= **0.23**

Standard Deviation $= \sqrt{Variance}$

$= \sqrt{0.23}$

=**0.48**

Interquartile Range $= Q_3 - Q_1$

= 2-1

= **1**

How far is your driving distance? (KM)

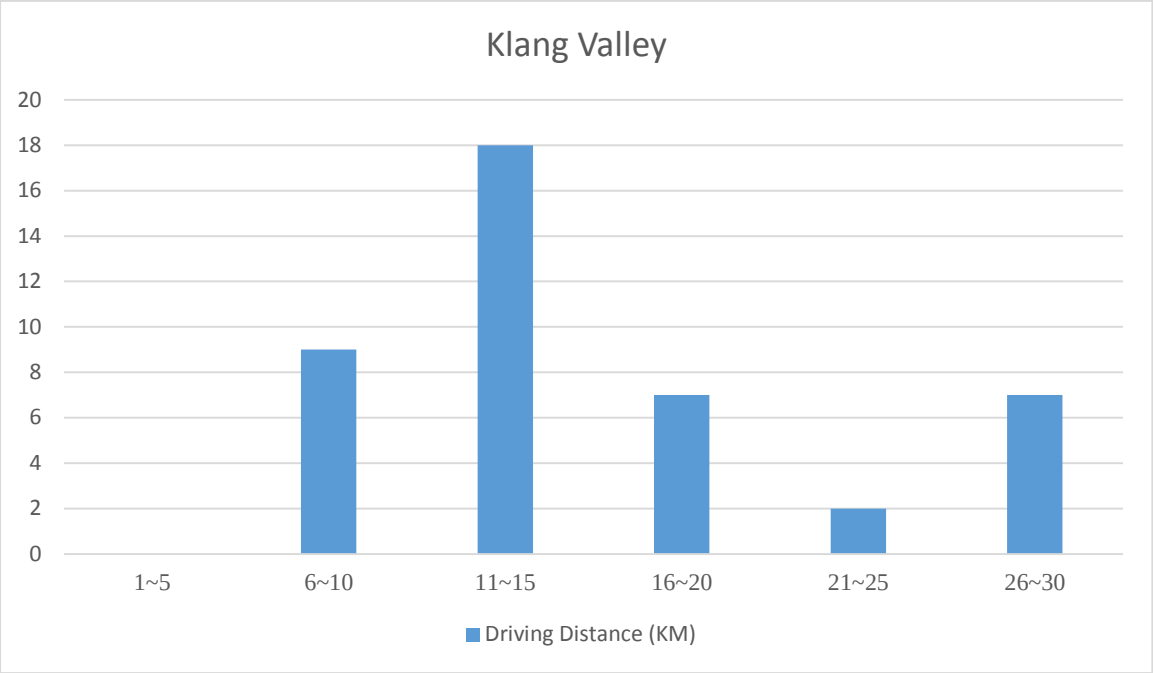

Figure 3.3

According to the bar chart above, the mode is 11-15 KM. Majority of the Klang Valley residents we surveyed drive within the distance 11-15KM, followed by 6-10KM, 16-20KM and 26-30KM, lastly 21-25KM. None of the Klang Valley residents we surveyed drive within the distance 1-5KM.

Driving Distance (KM)	**f**	**F**	**x**	**fx**	**fx^2**
1-5	0	0	3	0	0
6-10	9	9	8	72	576
11-15	18	27	13	234	3042
16-20	7	34	18	126	2268
21-25	2	36	23	46	1058
26-30	7	43	28	196	5488
	$\Sigma f=43$			$\Sigma fx= 674$	$\Sigma fx^2=12432$

Mean $=\frac{\sum fx}{\sum f}$

$= \frac{674}{43}$

= **15.67**

Modal class = **11KM-15 KM**

Median $= 10.5 + \left(\frac{0.5(43)-9}{18}\right)(5)$

= **13.97**

Q_1 $= 10.5 + \left(\frac{0.25(43)-9}{18}\right)(5)$

= **10.99**

Q_3 $= 15.5 + \left(\frac{0.75(43)-27}{7}\right)(5)$

= **19.25**

Variance $=\frac{\sum fx^2}{\sum f}-(\bar{x})^2$

$= \frac{12432}{43} - (15.67)^2$

= **43.57**

Standard Deviation $= \sqrt{Variance}$

$=\sqrt{43.57}$

= **6.6**

Interquartile Range = $Q_3 - Q_1$

= 19.25-10.99

= **8.26**

How far is your driving distance? (KM)

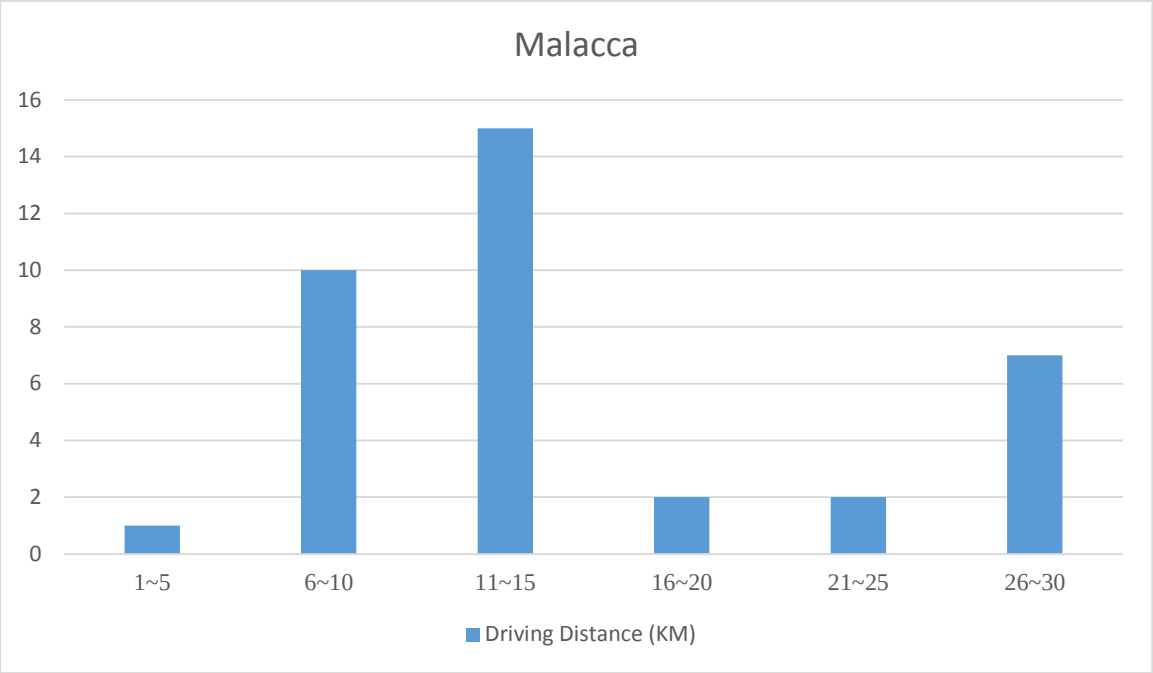

Figure 3.4

According to the bar chart above, the mode is 11-15 KM. Majority of the Klang Valley residents drive within the range 11-15Km, followed by 6-10KM, 26-30KM, 16-20KM and 21-25KM and lastly 1-5KM.

Driving Distance (KM)	f	F	x	fx	fx^2
1-5	1	1	3	3	9
6-10	10	11	8	80	640
11-15	15	26	13	195	2535
16-20	2	28	18	36	648
21-25	2	30	23	46	1058
26-30	5	35	28	140	3920
	$\Sigma f=35$			$\Sigma fx=500$	$\Sigma fx^2=8810$

Mean $= \frac{\sum fx}{\sum f}$

$= \frac{500}{35}$

= **14.29**

Modal class = **11KM-15KM**

Median $= 10.5 + \left(\frac{0.5(35)-11}{15}\right)(5)$

= **16**

Q_1 $= 5.5 + \left(\frac{0.25(43)-1}{10}\right)(5)$

= **13.25**

Q_3 $= 10.5 + \left(\frac{0.75(43)-11}{15}\right)(5)$

= **15.58**

Variance $= \frac{\sum fx^2}{\sum f} - (\bar{x})^2$

$= \frac{8810}{35} - (14.29)^2$

= **47.51**

Standard Deviation $= \sqrt{Variance}$

$= \sqrt{47.51}$

= **6.89**

Interquartile Range = $Q_3 - Q_1$

= 15.58-13.25

= **2.33**

Further Analysis

How much did you spend in purchasing your car?

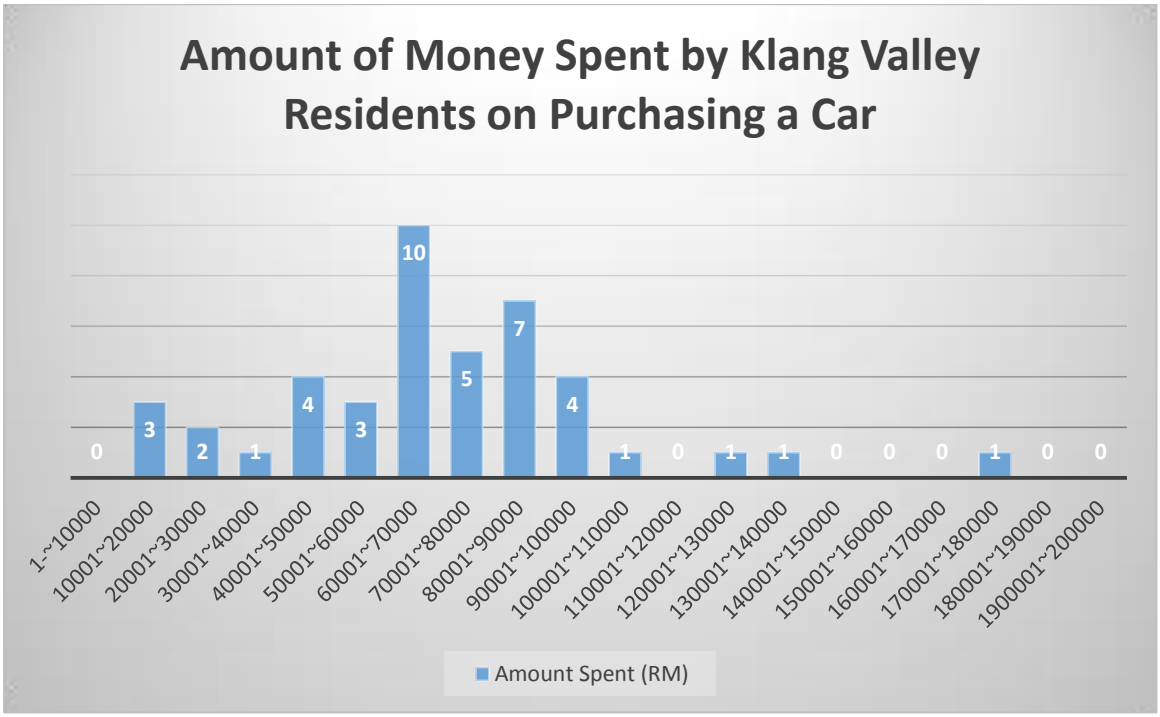

Figure 3.5

The figure above show the amount of money spent by Klang Valley residents on purchasing a car. According to the bar chart, majority of the Klang Valley residents who participated in the survey spend within the range RM60001-RM70000 in purchasing a car. None of the Klang Valley residents who participated in the survey spend within the range RM1-RM10000, RM100000-RM110000, RM150000-RM160000, RM160001-RM170000, RM180000-RM190000 and RM190001-RM200000.

Amount Spent (RM)	f	F	x	fx	fx^2
1-10000	0	0	5000.5	0	0
10001-20000	3	3	15000.5	45001.5	675045000.8
20001-30000	2	5	25000.5	50001	120050001
30001-40000	1	6	35000.5	35000.5	1225035000
40001-50000	4	10	45000.5	180002	8100180001
50001-60000	3	13	55000.5	165001.5	9075165001
60001-70000	10	23	65000.5	650005	42250650002.5
70001-80000	5	28	75000.5	375002.5	28125375001.2
80001-90000	7	35	85000.5	595003.5	50575595001.7
90001-100000	4	39	95000.5	380002	36100380001
100000-110000	0	40	105000.5	105000.5	1575060000.25
110001-120000	1	40	115000.5	0	0
120001-130000	0	41	125000.5	125000.5	15625125000.2
130001-140000	1	42	135000.5	135000.5	18225135000.2
140001-150000	1	42	145000.5	0	0
150001-160000	0	42	155000.5	0	0
160001-170000	0	42	165000.5	0	0
170001-180000	1	43	175000.5	175000.5	30625175000.2
180001-190000	0	43	185000.5	0	0
190001-200000	0	43	195000.5	0	0
	$\Sigma f=43$			$\Sigma fx=2365016.5$	$\Sigma fx^2=216984970010$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{2365016.5}{43}$=**55000.38**

Modal class= **RM60001-RM70000**

Median=60000.5+$\left(\frac{\frac{43}{2}-13}{10}\right)(1000)$=**60850.5**

Q_1=50000.5+$\left(\frac{\frac{43}{4}-10}{3}\right)(1000)$=**52500.5**

Q_3=80000.5+$\left(\frac{\frac{3(43)}{4}-28}{7}\right)$(1000)=**80607.64**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{216984970010}{43}$-$(55000.38)^2$

=**202112093**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{202112093}$

=**44956.87**

Interquartile Range= $Q_{3-}Q_1$

=80607.64-52500.5

=**28107.14**

How much did you spend in purchasing your car?

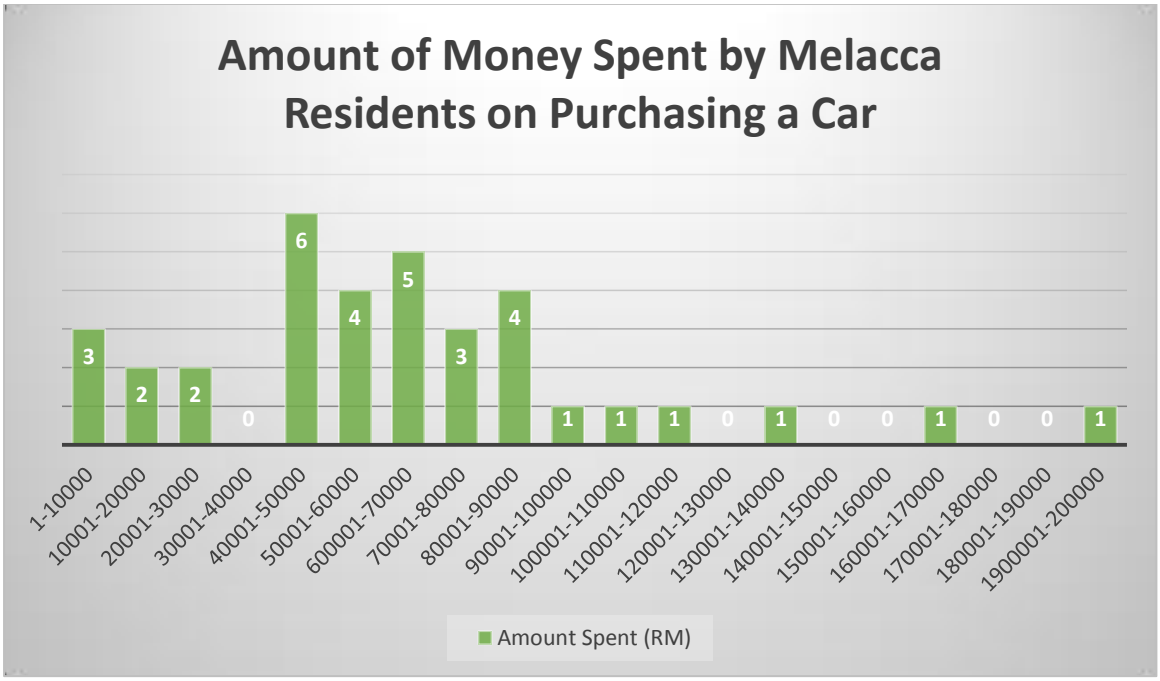

Figure 3.6

The figure above show the amount of money spent by Malacca residents on purchasing a car. According to the bar chart, the mode is RM40001-RM50001 where majority of the Malacca residents who participated in the survey spend within the range RM40001-RM50000 in purchasing a car. None of the Malacca residents who participated in the survey spend within the range RM30001-RM40000, RM120001-RM130000, RM140001-RM150000, RM150001-RM160000, RM170001-RM180000 and RM180001-RM190000 for purchasing a car.

Amount Spent (RM)	f	F	x	fx	fx^2
1-10000	3	3	5000.5	15001.5	75015000.75
10001-20000	2	5	15000.5	30001	450030000.5
20001-30000	2	7	25000.5	50001	1250050001
30001-40000	0	7	35000.5	0	0
40001-50000	6	13	45000.5	270003	12150270001.5
50001-60000	4	17	55000.5	220002	1100120001
60001-70000	5	22	65000.5	325002.5	21125325001.2
70001-80000	3	25	75000.5	225001.5	16875225000.7
80001-90000	4	29	85000.5	340002	2890034000.1
90001-100000	1	30	95000.5	95000.5	9025095000.25
100001-110000	1	31	105000.5	105000.5	11025105000.2
110001-120000	1	32	115000.5	115000.5	13225115000.2
120001-130000	0	32	125000.5	0	0
130001-140000	1	33	135000.5	135000.5	1822513000.2
140001-150000	0	33	145000.5	0	0
150001-160000	0	33	155000.5	0	0
160001-170000	1	34	165000.5	165000.5	27225165000.2
170001-180000	0	34	175000.5	0	0
180001-190000	0	34	185000.5	0	0
190001-200000	1	35	195000.5	195000.5	38025195000.2
	$\Sigma f=35$			$\Sigma fx=2285017.5$	$\Sigma fx^2=156264257007$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{2285017.5}{35}$=**65286.21**

Modal class= **RM40001-RM50000**

Median=60000.5+$\left(\frac{\frac{35}{2}-17}{5}\right)(1000)$=**60100.5**

Q_1=40000.5+$\left(\frac{\frac{35}{4}-7}{6}\right)(1000)$=**40292.17**

Q_3=80000.5+$\left(\frac{\frac{3(35)}{4}-7}{6}\right)$(1000)=**80313**

Variance=$\frac{\sum fx^2}{\sum f}-(\bar{x})^2$

=$\frac{156264257007}{35}-(65286.21)^2$

=**202403841**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{202403841}$

=**14226.87**

Interquartile Range= Q_3-Q_1

=80313-40292.17

=**40020.83**

How much did you pay for your monthly instalment?

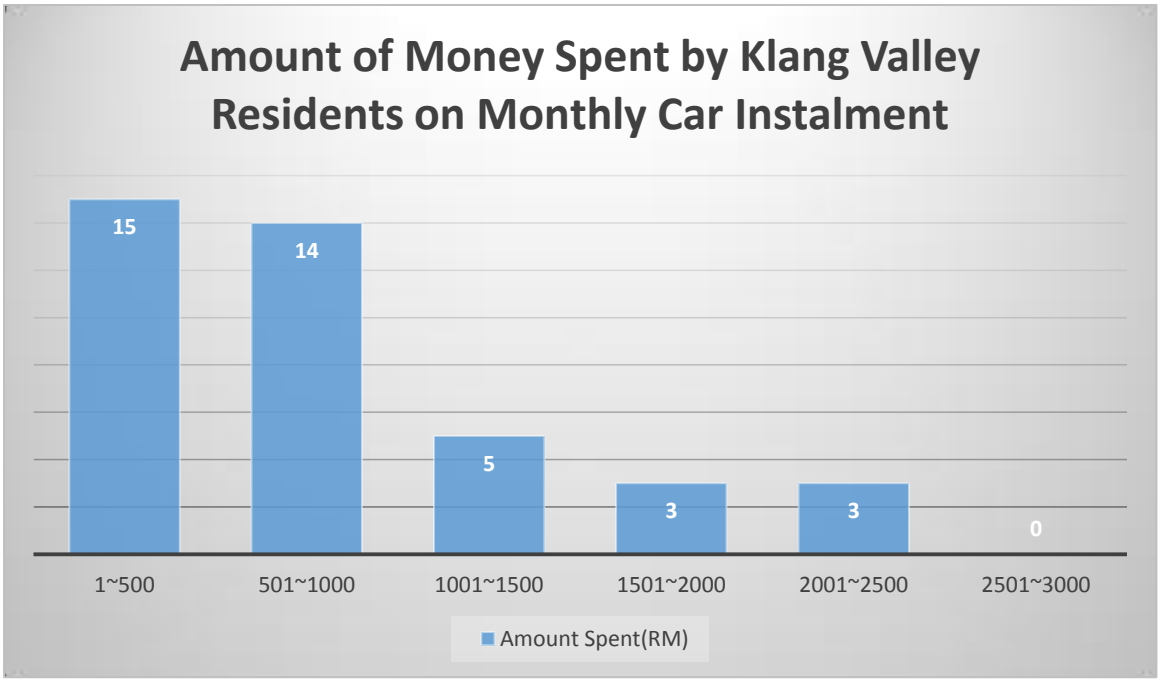

Figure 3.7

According to the bar chart, the mode is RM1-RM500 where majority of the Klang Valley residents that we have surveyed spend within the range RM1-RM500 for monthly car instalment. None of the Klang Valley residents that we have surveyed spend within the range RM2501-RM3000 for monthly car instalment.

Amount Spent (RM)	f	F	x	fx	fx^2
1-500	15	15	250.5	3757.5	941253.75
501-1000	14	29	750.5	10507	7885503.5
1001-1500	5	34	1250.5	6252.5	7818751.25
1501-2000	3	37	1750.5	5251.5	9192750.75
2001-2500	3	40	2250.5	6751.5	15194250.75
2501-3000	0	40	2750.5	0	0
	$\Sigma f=40$			$\Sigma fx=32520$	$\Sigma fx^2=41032510$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{32520}{40}$=**813**

Modal class= **RM1-RM500**

Median=0.5+$\left(\frac{\frac{40}{2}-0}{15}\right)(500)$=**667.17**

Q_1=0.5+$\left(\frac{\frac{40}{4}-0}{15}\right)(500)$=**333.83**

Q_3=1000.5+$\left(\frac{\frac{3(40)}{4}-29}{5}\right)$(500)=**1100.5**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{41032510}{40}$-$(813)^2$

=**364843.75**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{364843.75}$

=**604.02**

Interquartile Range= $Q_3 - Q_1$

=1100.5-333.83

=**766.67**

How much did you pay for your monthly instalment?

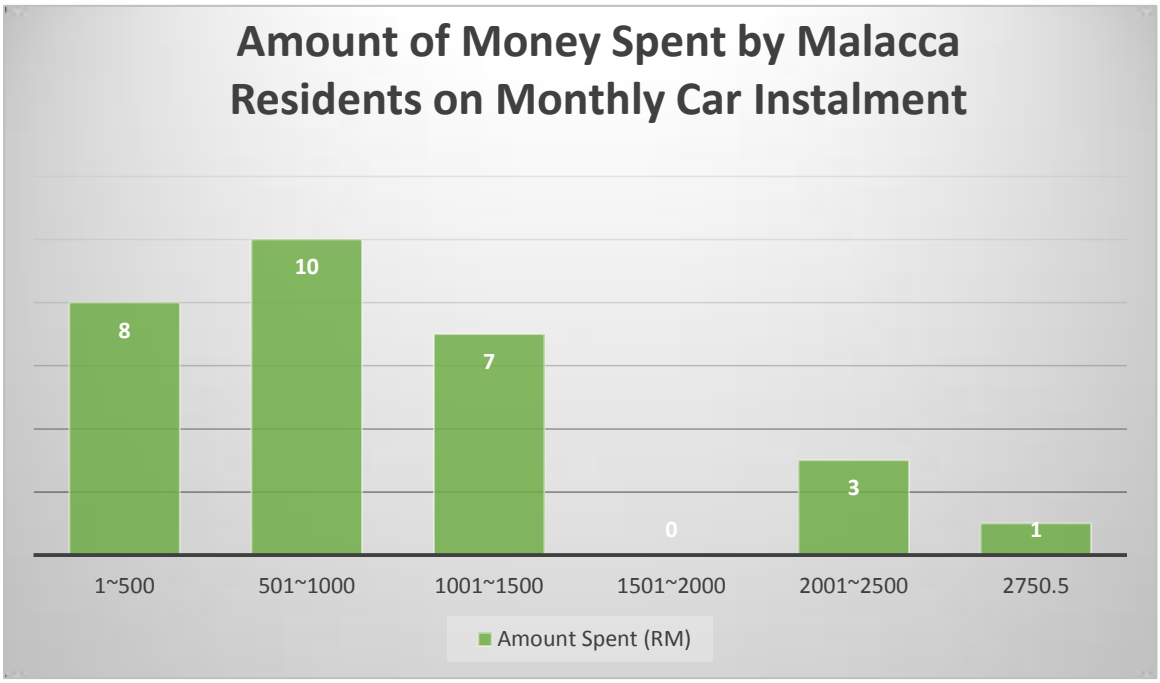

Figure 3.8

According to the bar chart, the mode is RM501-RM1000 where majority of the Malacca residents that we have surveyed spend within the range RM501-RM1000 for monthly car instalment. None of the Malacca residents that we have surveyed spend within the range RM1501-RM2000 for monthly car instalment.

Amount Spent (RM)	f	F	x	fx	fx^2
1-500	8	8	250.5	2004	502002
501-1000	10	18	750.5	7505	5632502.5
1001-1500	7	25	1250.5	8753.3	10946251.75
1501-2000	0	25	1750.5	0	0
2001-2500	3	28	2250.5	6751.5	15194250.75
2501-3000	1	29	2750.5	2750.5	7565250.25
	$\Sigma f=29$			$\Sigma fx=27764.5$	$\Sigma fx^2=39851527.25$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{27764.5}{29}$=**957.4**

Modal class= **501-1000**

Median=500.5+$\left(\frac{\frac{29}{2}-8}{10}\right)(500)$=**825.5**

Q_1=0.5+$\left(\frac{\frac{29}{4}-0}{8}\right)(500)$=**453.63**

Q_3=1000.5+$\left(\frac{\frac{3(29)}{4}-18}{7}\right)$(500)=**1268.36**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{39851527.25}{29}$-$(957.4)^2$

=**457575.83**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{457575.83}$

=**676.44**

Interquartile Range= $Q_3 - Q_1$

=1268.36-435.63

=**832.73**

How much did you spend on petrol per month?

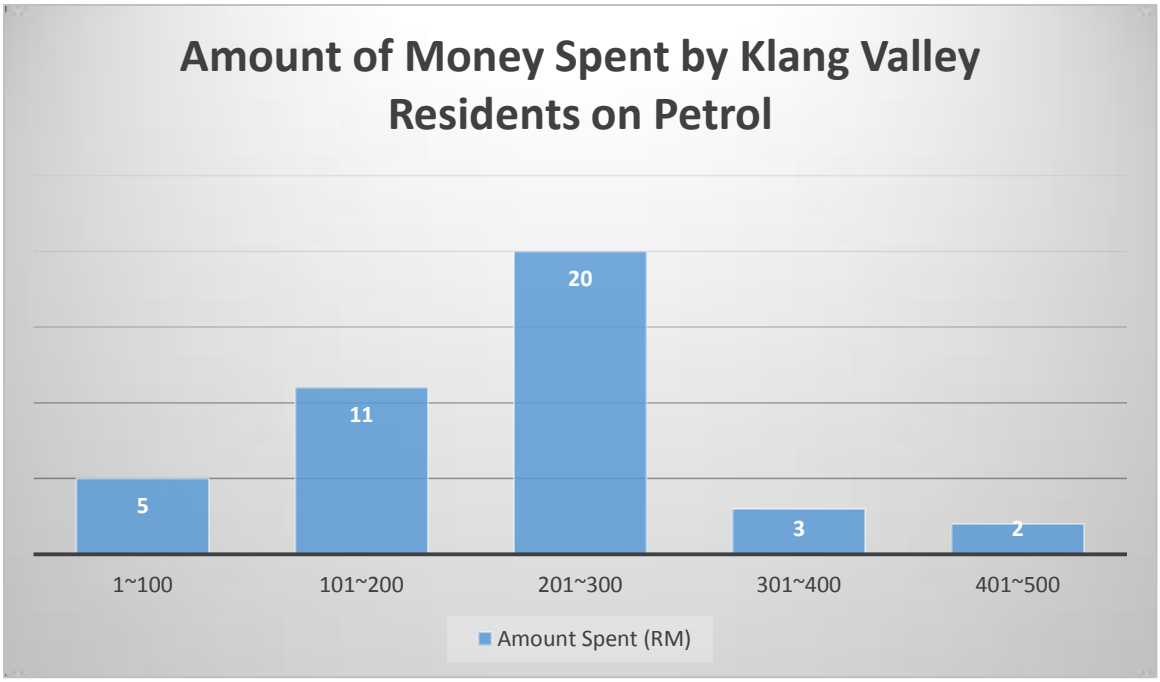

Figure 3.9

According to the bar chart, the mode is RM201-RM300.Majority of the Klang Valley residents that we have surveyed spend within the range RM201-RM300 for petrol, followed by RM101-RM200, RM301-RM400, RM401-RM500 and lastly RM1-RM100.

Amount Spent (RM)	f	F	x	fx	fx^2
1-100	1	1	50.5	50.5	2550.25
101-200	11	12	150.5	1655.5	249152.75
201-300	20	32	250.5	5010	1255005
301-400	9	41	350.5	3154.5	1105652.25
401-500	2	43	450.5	901	405900.5
	$\Sigma f=43$			$\Sigma fx=10771.5$	$\Sigma fx^2=3081260.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{10771.5}{43}$=**250.5**

Modal class= **201-300**

Median=200.5+$\left(\frac{\frac{43}{2}-12}{20}\right)(100)$=**248**

Q_1=100.5+$\left(\frac{\frac{43}{4}-1}{11}\right)(100)$=**189.14**

Q_3=300.5+$\left(\frac{\frac{3(43)}{4}-32}{9}\right)$(100)=**303.28**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{3081260.75}{43}$-$(250.5)^2$

=**8906.98**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{8906.98}$

=**94.38**

Interquartile Range= $Q_3 - Q_1$

=303.28-189.14

=**114.14**

How much do you spend on petrol per month?

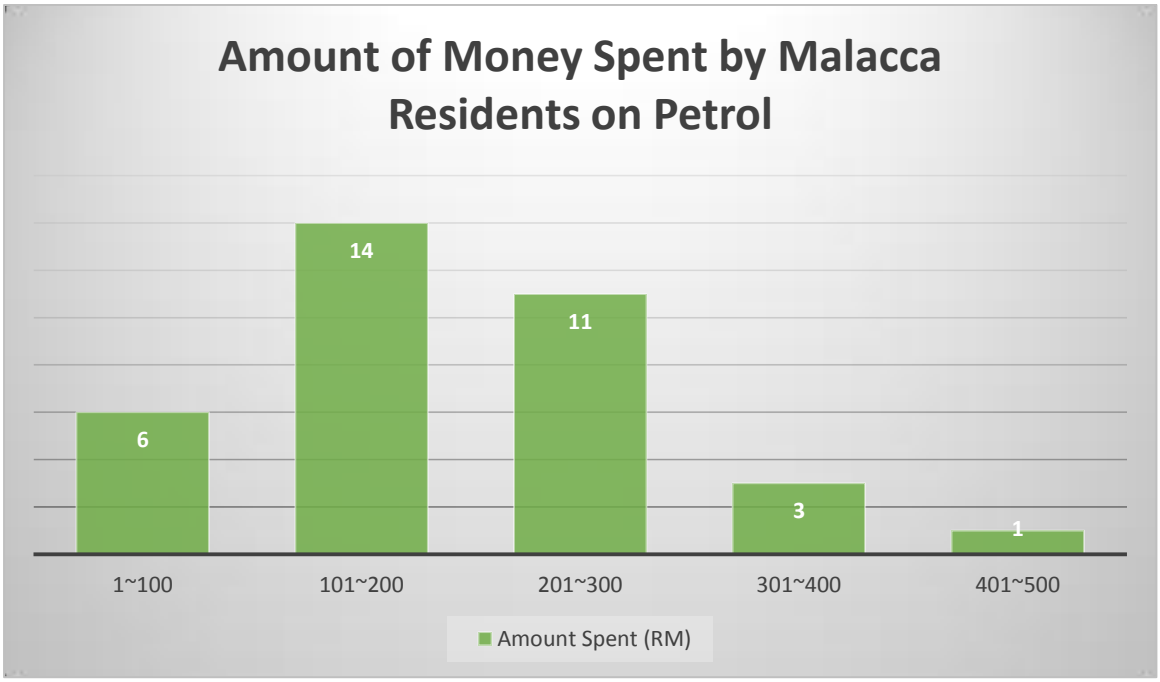

Figure 4.0

According to the bar chart, the mode is RM101-RM200.Majority of the Malacca residents that we have surveyed spend within the range RM101-RM200 for petrol, followed by RM201-RM300, RM1-RM100, RM301-RM400 and lastly RM401-RM500.

Amount Spent (RM)	f	F	x	fx	fx^2
1-100	6	6	50.5	303	15301.5
101-200	14	20	150.5	2107	317103.5
201-300	11	31	250.5	2755.5	690252.75
301-400	3	34	350.5	1051.5	368550.75
401-500	1	35	450.5	450.5	202950.25
	$\Sigma f=35$			$\Sigma fx=6667.5$	$\Sigma fx^2=1594158.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{6667.5}{35}$=**190.5**

Modal class= **101-200**

Median=100.5+$\left(\frac{\frac{35}{2}-6}{14}\right)(100)$=**182.64**

Q_1=100.5+$\left(\frac{\frac{35}{4}-6}{14}\right)(100)$=**120.14**

Q_3=200.5+$\left(\frac{\frac{3(35)}{4}-20}{11}\right)$(100)=**257.32**

Variance=$\frac{\sum fx^2}{\sum f}-(\bar{x})^2$

=$\frac{1594158.75}{35}-(190.5)^2$

=**9257.14**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{9257.14}$

=**96.21**

Interquartile Range= Q_3-Q_1

=257.32-120.14

=**137.18**

How much did you spend in modifying your car?

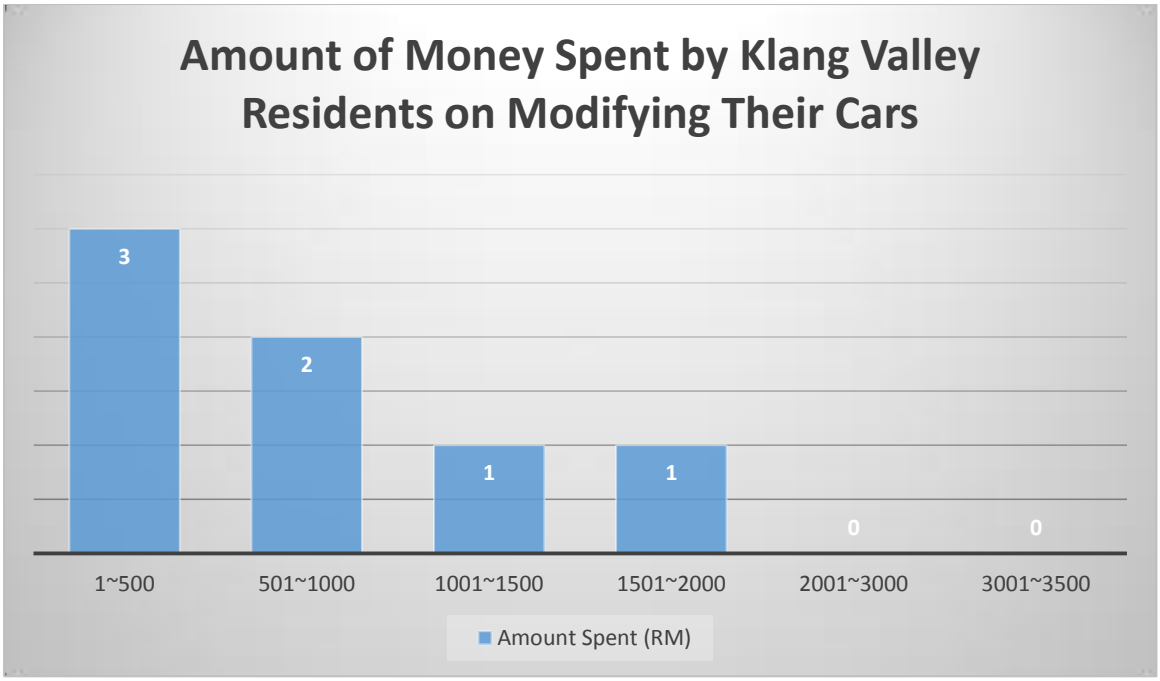

Figure 4.1

According to the bar chart, the mode is RM1-RM500 where majority of the Klang Valley residents that we have surveyed spend within the range RM1-RM500 in modifying their cars. None of the Klang Valley residents that we have surveyed spend within the range RM2001-RM2500 and RM2501-RM3000 in modifying their cars.

Amount Spent (RM)	f	F	x	fx	fx^2
1-500	3	3	250.5	751.5	188250.75
501-1000	2	5	750.5	1501	1126500.5
1001-1500	1	6	1250.5	1250.5	1563750.25
1501-2000	1	7	1750.5	1750.5	3064250.25
2001-2500	0	7	2250.5	0	0
2501-3000	0	7	2750.5	0	0
	$\Sigma f=7$			$\Sigma fx=5253.5$	$\Sigma fx^2=5942751.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{5253.5}{7}$=**750.5**

Modal class= **1-500**

Median=500.5+$\left(\frac{\frac{7}{2}-3}{2}\right)(500)$=**625.5**

Q_1=0.5+$\left(\frac{\frac{7}{4}-0}{3}\right)(500)$=**292.17**

Q_3=1000.5+$\left(\frac{\frac{3(7)}{4}-5}{1}\right)$(500)=**1125.5**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{5942751.75}{7}$-$(750.5)^2$

=**285714.29**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{285714.29}$

=**534.52**

Interquartile Range= $Q_3 - Q_1$

=1125.5-292.17

=**833.33**

How much did you spend in modifying your car?

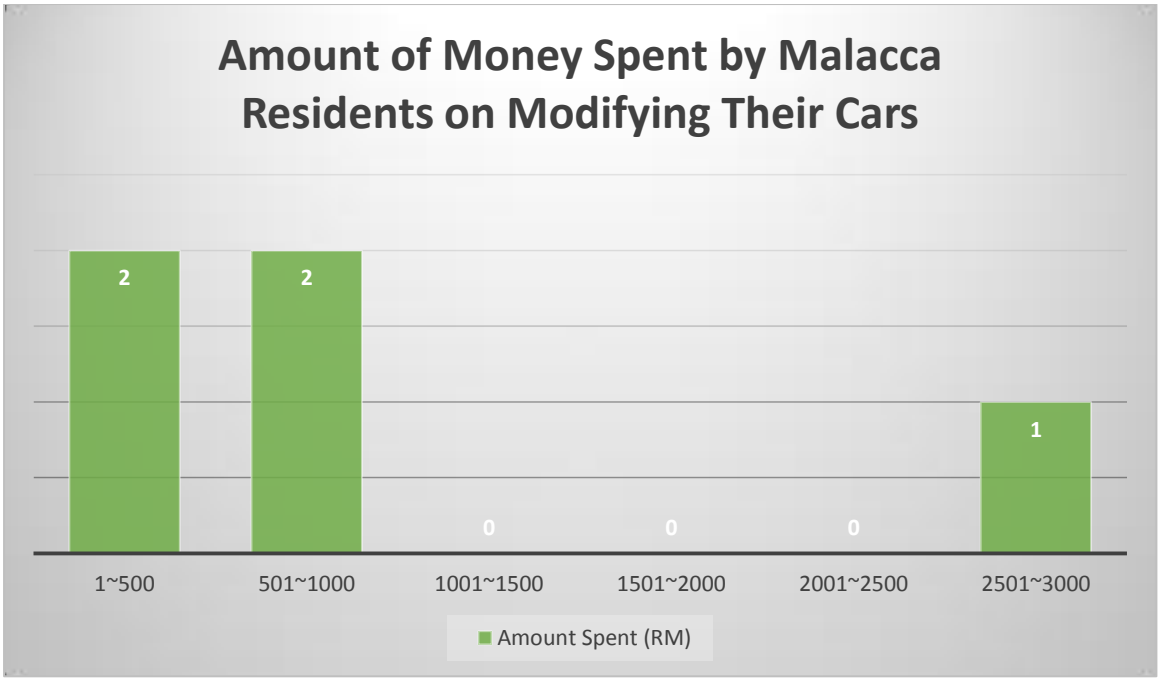

Figure 4.2

According to the bar chart, the mode are RM1-RM500 andRM501-RM1000 where majority of the Malacca residents that we have surveyed spend within the range RM1-RM500 and RM501-RM1000 in modifying their cars. None of the Malacca residents that we have surveyed spend within the range RM1001-RM1500, RM1501-RM2000, RM2001-RM2500, RM2501-RM3000 in modifying their cars.

Amount Spent (RM)	f	F	x	fx	fx^2
1-500	2	2	250.5	501	12500.5
501-1000	2	4	750.5	1501	1126500.5
1001-1500	0	4	1250.5	0	0
1501-2000	0	4	1750.5	0	0
2001-2500	0	4	2250.5	0	0
2501-3000	1	5	2750.5	2750.5	7565250.25
	$\Sigma f=5$			$\Sigma fx=4752.5$	$\Sigma fx^2=88172512.5$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{4752.5}{5}$=**950.5**

Modal class= RM**1-RM500**

Median=500.5+$\left(\frac{\frac{5}{2}-2}{2}\right)(500)$=**625.5**

Q_1=0.5+$\left(\frac{\frac{5}{4}-0}{2}\right)(500)$=**313**

Q_3=500.5+$\left(\frac{\frac{3(5)}{4}-2}{2}\right)$(500)=**938**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{88172512.5}{5}$-$(950.5)^2$

=**16731052.25**

Standard Deviation= $\sqrt{\text{Variance}}$

=$\sqrt{16731052.25}$

=**4090.36**

Interquartile Range= $Q_3 - Q_1$

=938-313

=**625**

How much do you spend on car maintenance?

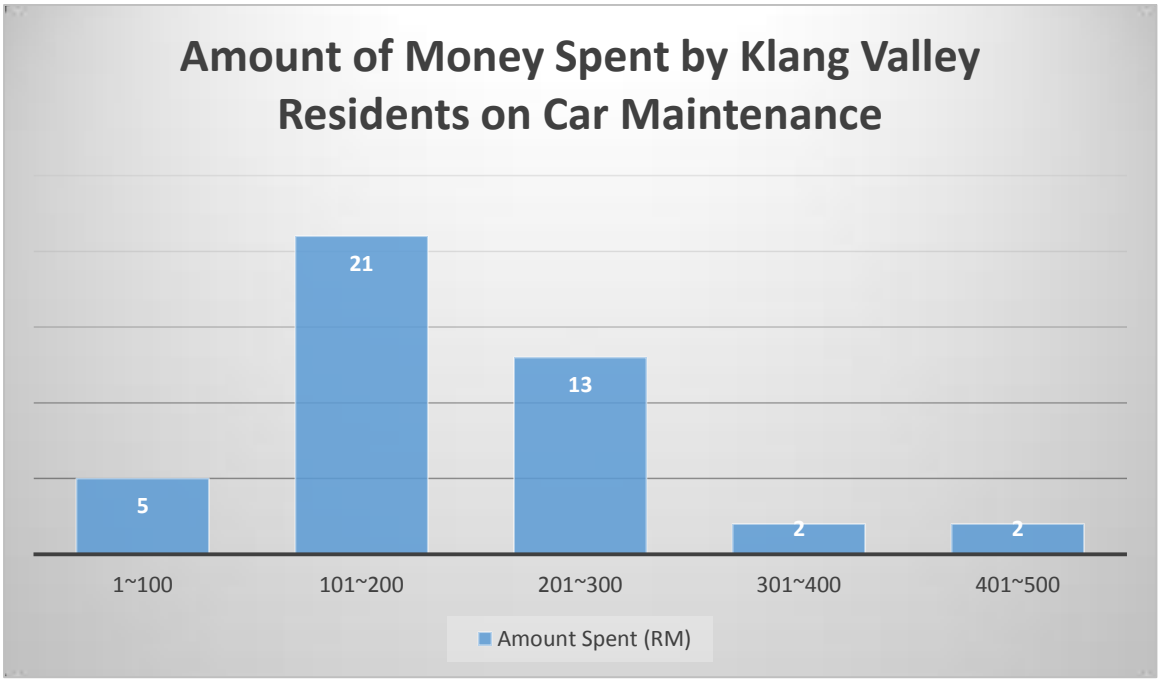

Figure 4.3

According to the bar chart, the mode is RM101-RM200.Majority of the Klang Valley residents that we have surveyed spend within the range RM101-RM200 for car maintenance followed by RM201-RM300, RM1-RM100, lastly RM301-RM400 and RM401-RM500.

Amount Spent (RM)	f	F	x	fx	fx^2
1-100	5	5	50.5	252.5	12751.25
101-200	21	26	150.5	3160.5	475655.25
201-300	13	39	250.5	3256.5	815753.25
301-400	2	41	350.5	701	245700.5
401-500	2	43	450.5	901	405900.5
	$\Sigma f=43$			$\Sigma fx=8271.5$	$\Sigma fx^2=1955760.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{8271.5}{43}$=**192.36**

Modal class=**RM101-RM200**

Median=100.5+$\left(\frac{\frac{43}{2}-5}{21}\right)(100)$=**179.07**

Q_1=100.5+$\left(\frac{\frac{43}{4}-5}{21}\right)(100)$=**127.88**

Q_3=200.5+$\left(\frac{\frac{3(43)}{4}-26}{13}\right)$(100)=**248.58**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{1955760.75}{43}$-$(192.36)^2$

=**16731052.25**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{8480.44}$

=**92.09**

Interquartile Range= $Q_3 - Q_1$

=248.58-127.88

=**120.7**

How much do you spend on car maintenance?

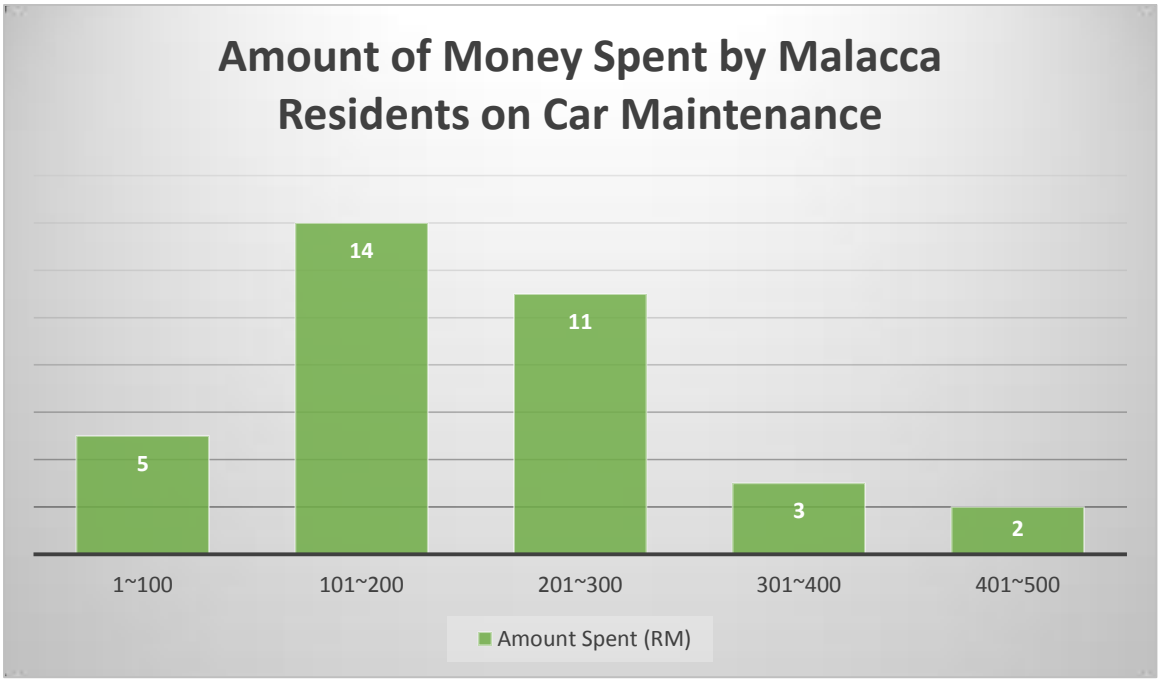

Figure 4.4

According to the bar chart, the mode is RM101-RM200.Majority of the Malacca residents that we have surveyed spend within the range RM101-RM200 for car maintenance, followed by RM201-RM300, RM1-RM100, RM301-RM400 and lastly RM401-RM500.

Amount Spent (RM)	f	F	x	fx	fx^2
1-100	5	5	50.5	252.5	12751.25
101-200	14	19	150.5	2107	317103.5
201-300	11	30	250.5	2755.5	690252.75
301-400	3	33	350.5	1051.5	368550.75
401-500	2	32	350.5	701	245700.5
	$\Sigma f=35$			$\Sigma fx=6867.5$	$\Sigma fx^2=1634358.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{6867.5}{35}$=**196.04**

Modal class= **101-200**

Median=100.5+$\left(\frac{\frac{35}{2}-5}{14}\right)(100)$=**189.79**

Q_1=100.5+$\left(\frac{\frac{35}{4}-5}{14}\right)(100)$=**127.29**

Q_3=200.5+$\left(\frac{\frac{3(35)}{4}-19}{11}\right)$(100)=**266.4**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{1634358.75}{35}$-$(196.04)^2$

=**8264.28**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{8264.28}$

=**90.91**

Interquartile Range= $Q_3 - Q_1$

=266.4-127.29

=**139.11**

How much do you spend on transportation?

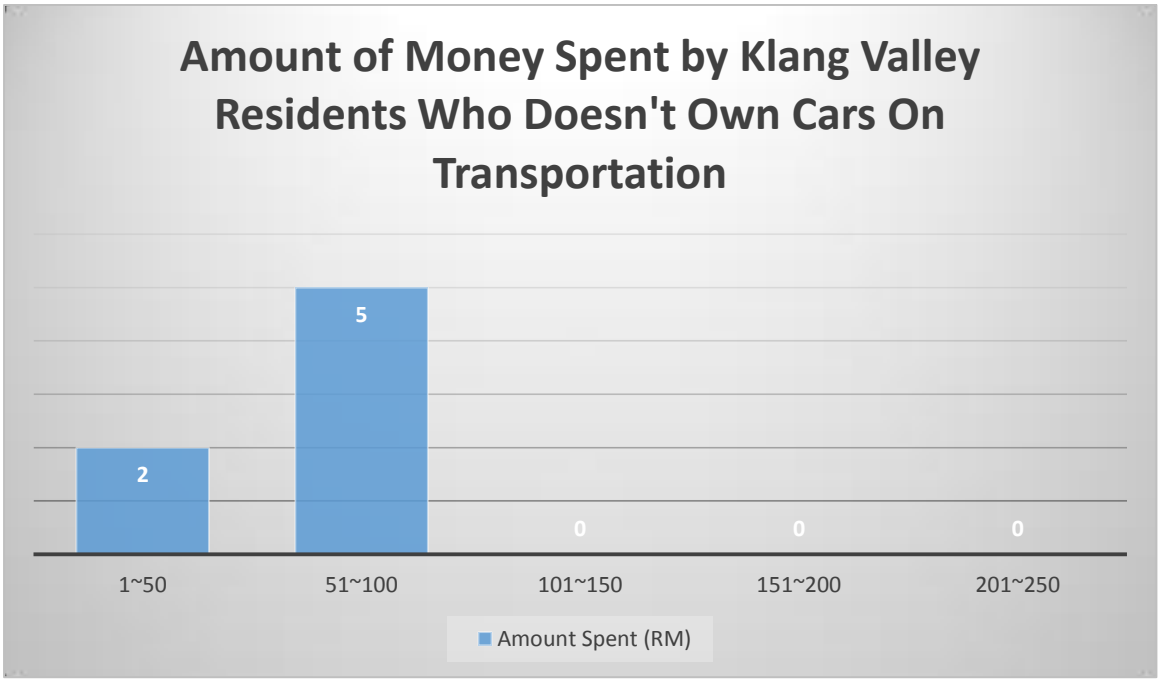

Figure 4.5

According to the bar chart, the mode is RM51- RM100. Majority of the Klang Valley residents who do not own cars spend within the range RM51-RM100 on transportation followed by RM1-RM50. None of the Klang Valley residents we have surveyed spend within the range RM101-RM150, RM151-RM200 and RM201-RM250.

Amount Spent (RM)	f	F	x	fx	fx^2
1-50	2	2	25.5	51	1300.5
51-100	5	7	75.5	377.5	28501.25
101-150	0	7	125.5	0	0
151-200	0	7	175.5	0	0
201-250	0	7	225.5	0	0
	$\Sigma f=7$			$\Sigma fx=428.5$	$\Sigma fx^2=29801.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{428.5}{7}$=**61.21**

Modal class= **51-100**

Median=50.5+$\left(\frac{\frac{7}{2}-2}{5}\right)(50)$=**65.5**

Q_1=0.5+$\left(\frac{\frac{7}{4}-0}{2}\right)(50)$=**44.25**

Q_3=50.5+$\left(\frac{\frac{3(7)}{4}-2}{5}\right)$(50)=**83**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{29801.75}{7}$-$(61.21)^2$

=**510.73**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{510.73}$

=**22.6**

Interquartile Range= $Q_3 - Q_1$

=83-44.25

=**38.75**

How much do you spend on transportation?

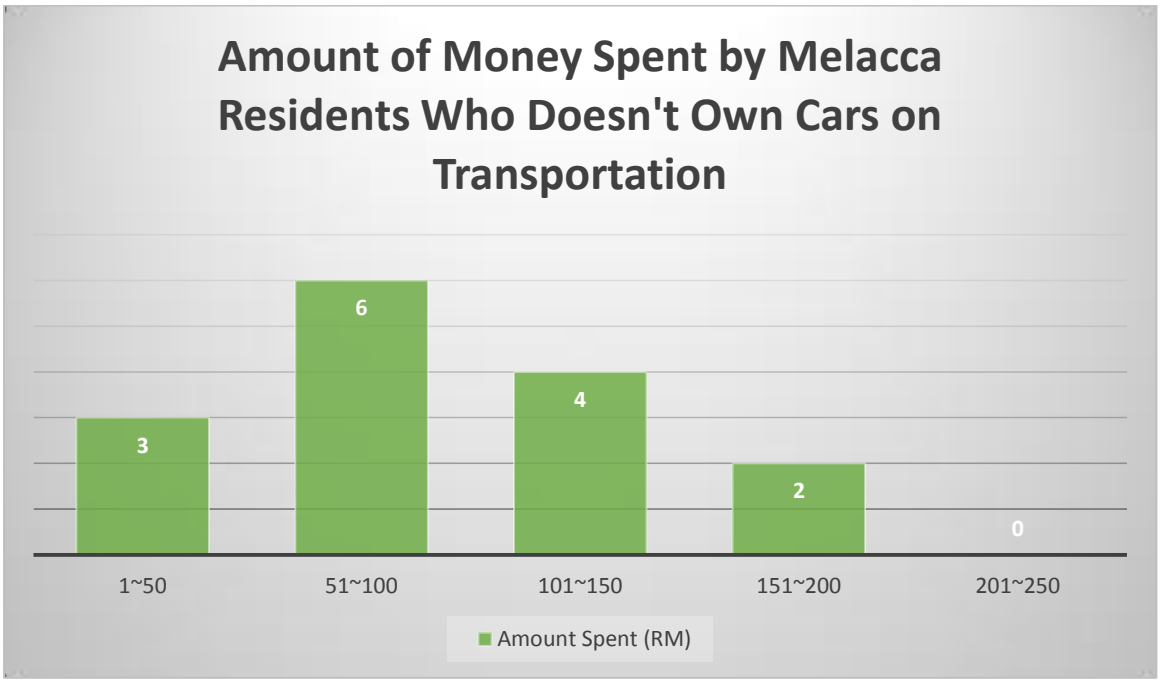

Figure 4.6

According to the bar chart, the mode is RM51- RM100. Majority of the Malacca residents who do not own cars spend within the range RM51-RM100 on transportation followed by RM101-RM150, RM1-RM50, and RM151-RM200.None of the Malacca residents we have surveyed spend within the range RM201-RM250.

Amount Spent (RM)	f	F	x	fx	fx^2
1-50	3	3	25.5	76.5	1950.75
51-100	6	9	75.5	453	34201.5
101-150	4	13	125.5	502	63001
151-200	2	15	175.5	351	61600.5
201-250	0	15	225.5	0	0
	$\Sigma f=15$			$\Sigma fx=1382.5$	$\Sigma fx^2=160753.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{1382.5}{15}$=**92.17**

Modal class= **51-100**

Median=50.5+$\left(\frac{\frac{15}{2}-3}{3}\right)(50)$=**125.5**

Q_1=50.5+$\left(\frac{\frac{15}{4}-3}{3}\right)(50)$=**100.75**

Q_3=100.5+$\left(\frac{\frac{3(15)}{4}-9}{4}\right)$(50)=**128.63**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{160753.75}{15}$-$(92.17)^2$

=**2221.61**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{2221.61}$

=**47.13**

Interquartile Range= $Q_3 - Q_1$

=128.63-100.75

=**27.88**

If you intend to buy a car in the future, how much do you intend to spend?

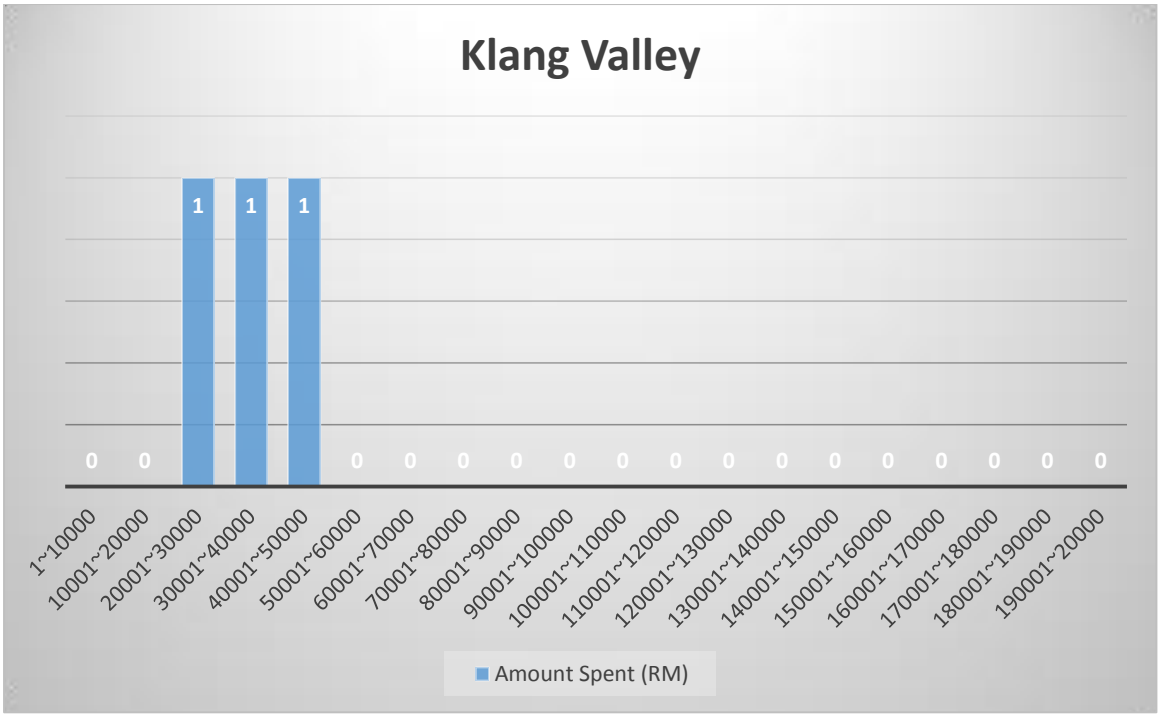

Figure 4.7

The bar chart above shows how much Klang Valley residents are willing to spend in buying a car in the future. The range RM20001-30000, RM30001-40000 and RM 400001-50000 each is chose by one Klang Valley resident who currently do not own cars by intend to buy one in the future.

Amount Spent (RM)	f	F	x	fx	fx^2
1-10000	0	0	5000.5	0	0
10001-20000	0	0	15000.5	0	0
20001-30000	1	1	25000.5	25000.5	625025000.25
30001-40000	1	2	35000.5	35000.5	1225035000.25
40001-50000	1	3	45000.5	45000.5	2025045000.25
50001-60000	0	3	55000.5	0	0
60001-70000	0	3	65000.5	0	0
70001-80000	0	3	75000.5	0	0
80001-90000	0	3	85000.5	0	0
90001-100000	0	3	95000.5	0	0
100000-110000	0	3	105000.5	0	0
110001-120000	0	3	115000.5	0	0
120001-130000	0	3	125000.5	0	0
130001-140000	0	3	135000.5	0	0
140001-150000	0	3	145000.5	0	0
150001-160000	0	3	155000.5	0	0
160001-170000	0	3	165000.5	0	0
170001-180000	0	3	175000.5	0	0
180001-190000	0	3	185000.5	0	0
190001-200000	0	3	195000.5	0	0
	$\Sigma f=3$			$\Sigma fx=105001.5$	$\Sigma fx^2=3875105000.75$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{105001.5}{3}$=**35000.5**

Modal class= **RM20001-30000, RM30001-40000 and RM 400001-50000**

Median=30000.5+$\left(\frac{\frac{3}{2}-1}{1}\right)(10000)$=**35000.5**

Q_1=20000.5+$\left(\frac{\frac{3}{4}-0}{1}\right)(10000)$=**27500.5**

Q_3=40000.5+$\left(\frac{\frac{3(3)}{4}-2}{1}\right)$(10000)=**42500.5**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{3875105000.75}{3}$-$(35000.5)^2$

=**66666666.42**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{66666666.42}$

=**8164.97**

Interquartile Range= $Q_3 - Q_1$

=42500.5-27500.5

=**15000**

If you intend to buy a car in the future, how much do you intend to spend?

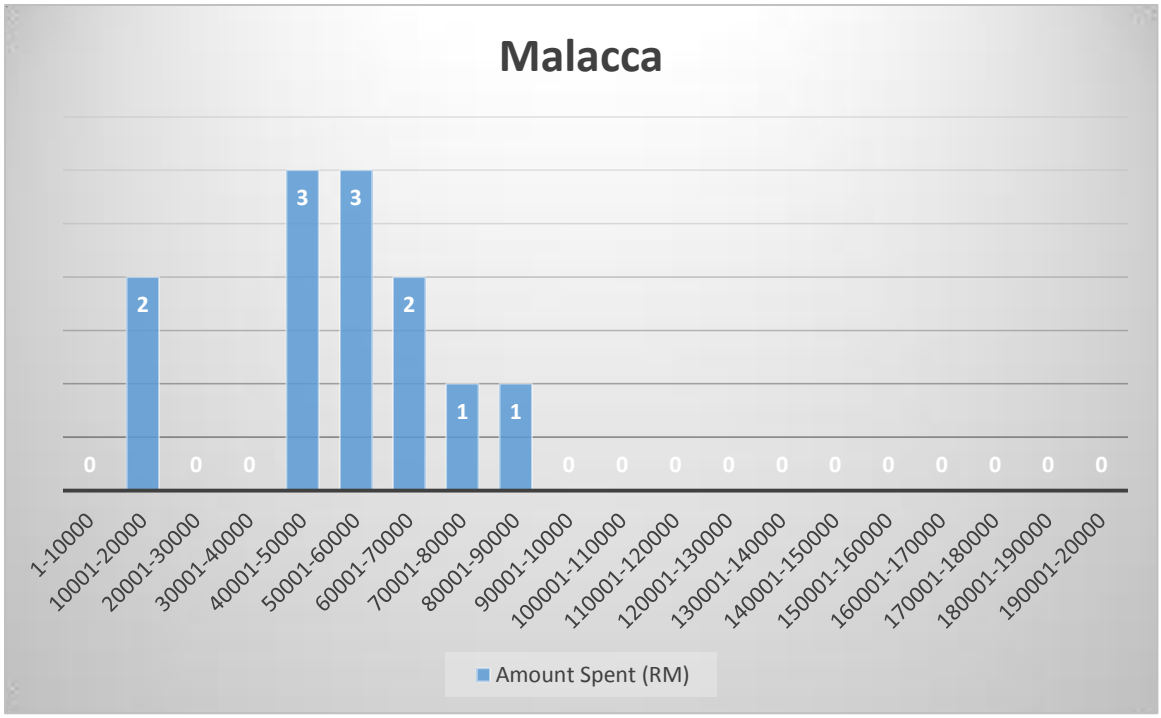

Figure 4.8

The bar chart above shows how much Malacca residents are willing to spend in buying a car in the future. The mode is RM40001-50000 and RM50001-60000. Majority of the Malacca residents that we surveyed are willing to spend within the rage RM40001-50000 and RM50001-60000 in buying a car, followed by RM10001-20000 and RM60000-70000, lastly RM70001-80000.

Amount Spent (RM)	f	F	x	fx	fx^2
1-10000	0	0	5000.5	0	0
10001-20000	2	2	15000.5	30001	450030000.5
20001-30000	0	2	25000.5	0	0
30001-40000	0	2	35000.5	0	0
40001-50000	3	5	45000.5	135001.5	6075135000.75
50001-60000	3	8	55000.5	165001.5	9075165000.75
60001-70000	2	10	65000.5	130001	8450130000.5
70001-80000	1	11	75000.5	75000.5	5625075000.25
80001-90000	1	12	85000.5	85000.5	7225085000.25
90001-100000	0	12	95000.5	0	0
100000-110000	0	12	105000.5	0	0
110001-120000	0	12	115000.5	0	0
120001-130000	0	12	125000.5	0	0
130001-140000	0	12	135000.5	0	0
140001-150000	0	12	145000.5	0	0
150001-160000	0	12	155000.5	0	0
160001-170000	0	12	165000.5	0	0
170001-180000	0	12	175000.5	0	0
180001-190000	0	12	185000.5	0	0
190001-200000	0	12	195000.5	0	0
	$\Sigma f=12$			$\Sigma fx=620006$	$\Sigma fx^2=36900620003$

Mean=$\frac{\sum fx}{\sum f}$=$\frac{620006}{12}$=**51667.17**

Modal class= **50001-60000**

Median=50000.5+$\left(\frac{\frac{12}{2}-5}{3}\right)(10000)$=**53333.83**

Q_1=40000.5+$\left(\frac{\frac{12}{4}-2}{3}\right)(10000)$=**43333.83**

Q_3=60000.5+$\left(\frac{\frac{3(12)}{4}-8}{2}\right)$(10000)=**65000.5**

Variance=$\frac{\sum fx^2}{\sum f}$-$(\bar{x})^2$

=$\frac{36900620003}{12}$-$(51667.17)^2$

=**405555210.9**

Standard Deviation= $\sqrt{Variance}$

=$\sqrt{\mathbf{405555210.9}}$

=**20138.40**

Interquartile Range= $Q_3 - Q_1$

=65000.5-43333.83

=**21666.67**

Conclusion

After conducting the survey and doing the calculations, we got to learn the spending behaviors of Klang Valley and Malacca on cars and for those who do not own cars, we got to learn about their spending behaviors on transportations. 43 out of 50 Klang Valley residents that we surveyed own cars and 35 out of 50 Malacca residents that we surveyed own cars.

For purchasing a car, the mean of amount of money spent by Klang Valley residents is RM55000.38 which is less than the mean of amount of money spent by Malacca residents on car, RM 65286.21.Even though the modal class of amount of money spent by Klang Valley residents is 60001-70000 while Malacca is lower with modal class 40001-50000 and there are less people in Malacca who owns car compared to Klang Valley. This means those who own a car in Malacca tend to spend more on purchasing compared to Klang Valley. This may be because those who could afford purchasing a car in Malacca are more financial capable compared to Klang Valley.

For car loan 40 out of 50 Klang Valley residents that we surveyed got a loan in order to purchase a car. The mean of the monthly installment they pay is RM 813. On the other hand, 29 out of 50 Malacca residents that we surveyed got a loan in order to purchase a car. The mean of the monthly installment they pay is RM 957.4 which is higher than Malacca. There are less people in Malacca compared to Klang Valley who got loans in order to purchase a car. This could be because the Malacca residents who own cars are capable to pay for their car in one go compared to Klang Valley residents who got car loans and pay high monthly installments.

For petrol, the mean of amount spent by Klang Valley residents is RM250.50 and for Malacca residents is RM190.50. This shows that Klang Valley residents tend to spend more than Melaka residents in petrol. The obvious reason for this event would be the driving distance of Klang Valley residents is further compared to Malacca residents.

For car modifying, 7 out of 43 Klang Valley residents who own cars modified their cars while 5 out of 35 Malacca residents who own cars modified their cars. The mean of amount of money spent on car modifying by Klang Valley residents is RM 750.50 and Malacca residents is RM 950.50. Malacca residents tend to spend more in modifying their cars compared to Klang Valley residents. One obvious reason would be most Klang Valley residents bought cars in order to drive themselves from places to places especially for work proposes while Malacca residents see driving and car modifying as activities that they do to kill their free time.

For car maintenance, the mean amount of money spent by Klang Valley resident is RM192.36, for Malacca resident is RM196.04. When it comes to car maintenance, there isn't much difference for these two places, probably because residents of both places prioritize road safety.

On the other hand, there are 7 out of 50 Klang Valley residents and 15 out of 50 Malacca residents that we surveyed do not own cars. The mean amount of money for Klang Valley residents on transportation is RM61.21 and Malacca is RM92.17. Klang Valley residents tend to spend less in transportation than Malacca residents because compared to Malacca, Klang Valley has a greater diverse of public transport that comes with an affordable price tags. In Malacca, the choices are limited.

In conclusion, more Klang Valley residents tend to own cars, spend more in petrol and pay more of monthly installment compared to Malacca residents. Though less Malacca residents own cars but for those who do, they tend to spend more in purchasing a car, has lower tendency to get a loan and pay more for both car modifying and maintenance. This shows that those who own cars in Malacca tend to be more financial capable compared to those in Klang Valley. For those who do not own cars, Klang Valley residents spend less in transportations compared to Malacca residents because there are more and cheaper public transport options in Klang Valley compared to Malacca such as monorail and LRT.