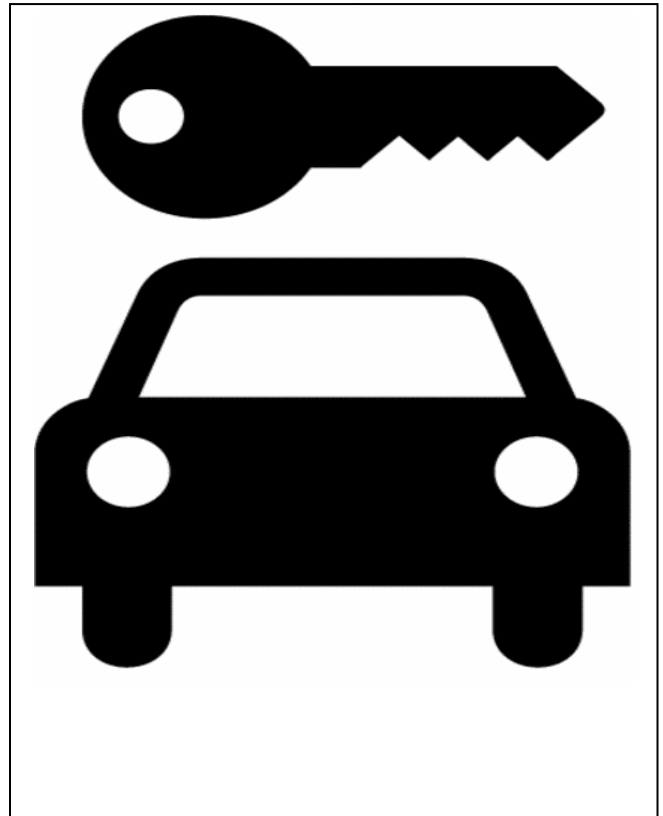


**C**ar

**S**election

**P**roblem



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**SMIT, MAJITAR**

## CAR

A car also gives us the freedom that we desire. Having your own car means you can reduce the amount of time you spend on public transport. Although public transport is a useful tool for work commuters and students, many of us out there are not too keen on the idea. A car also gives you the opportunity to go on spontaneous road trips that public transport simply cannot accommodate you with.

People also love their cars because they are an expression of their personality. When choosing a new car you can decide on what features are going to suit you, and if they don't already, YOU can change them. From custom paint jobs and designed cover art, to body kits and roof racks, your car can express the type of person you are and what your car means to you.

The best thing about owning a car is that it is totally yours. Nobody can tell you how to run it or what to do with it and it's entirely up to you where you take it. People love cars because of these exact reasons and this is essentially why it is such a big business across the world.

### **ABOUT CAR SELECTION PROBLEM**

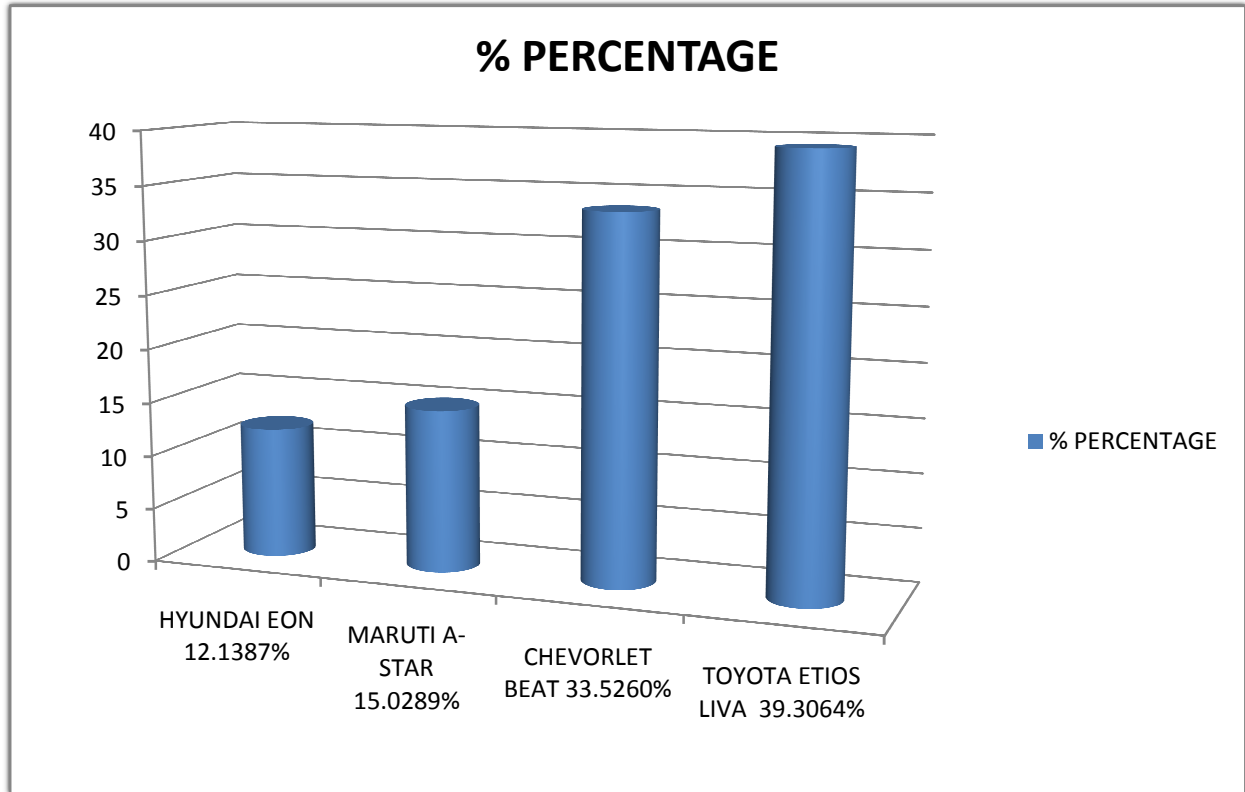
I have found that lots of people don't know how to choose best car for them. So I have done a research on car selection problem to find how to choose best car from available option. So that people will don't make mistake well choosing their dream car.

## Mistakes Made By People While Choosing Their Cars

- 1.** Sticking to buying a dream car.
- 2.** Focusing on the deal instead of the car.
- 3.** Having only dealer financing in mind. And etc.

## VOTES FOR BRAND NAME

FROM SURVEY REPORT



Vote as per brand name

This is to show how people blindly go for their dream car, just because of a brand name. This kind decision may leads to lose of yours initial as well future investment.

# TOOL USED TO SOLVE THE CAR SELECTION PROBLEM

## **ANALYTIC HIERARCHY PROCESS**

The Analytic Hierarchy Process (AHP), is a procedure designed to quantify managerial judgments of the relative importance of each of several conflicting criteria used in the decision making process. The concept of AHP was developed, amongst other theories, by **Thomas Saaty**, an American mathematician working at the University of Pittsburgh.

I choose this tool because it gives us the freedom to made comparison when no. of alternative and criteria is more than two.

And it simplifies the decision make by people and in return gives more satisfaction to that decision.

During the application of AHP in car selection problem, I have done both qualitative an quantitative Analysis to gets the best car from available alternative compare with criteria.

## Qualitative information collected from site called Car wale (internet)

For all 4 alternatives



# HYUNDAI

MODEL	Eon (sportz) petrol	
COST	3,75,883(Ex-showroom price)	
MILEAGE	21.1 kmpl	
SERVICING FACILITIES	241 dealerships in 168 cities across India	
COMFORT AND CONVIENCE	<ul style="list-style-type: none"> <li>Cup-holders</li> <li>Folder rear seat</li> <li>Tachometer</li> <li>Leather seats</li> <li>AM/FM radio</li> <li>CD player</li> <li>Air conditioner</li> <li>Power door locks</li> <li>Power steering</li> <li>Power steering</li> <li>Power seats</li> <li>Steering adjustment</li> <li>Central locking</li> <li>Defogger (rear)</li> </ul>	<ul style="list-style-type: none"> <li>√</li> <li>√</li> <li>-</li> <li>-</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>-</li> <li>√</li> <li>√</li> <li>-</li> </ul>

	Remote boot/ fuel-lid	√
	Power window	√
	Alloy wheels	-
	Tubeless tyres	√
	Sun - roof	-
	Front fog lights	√
	Rear wash wiper	-
	Anti-lock braking system	-
	Driver air-bags	√
	Passenger air-bags	-
	Immobilizer	√
	Traction control	-
	Child safety locks	√



# CHEVORLET

MODEL	Chevrolet beat ( Ls petrol)	
COST	3,91,859 (Ex-showroom price)	
MILEAGE	18.61 kmpl	
SERVICING FACILITIES	180 dealerships in 141 cities across India	
COMFORT AND CONVIENCE	<ul style="list-style-type: none"> <li>Cup-holders</li> <li>Folder rear seat</li> <li>Tachometer</li> <li>Leather seats</li> <li>AM/FM radio</li> <li>CD player</li> <li>Air conditioner</li> <li>Power door locks</li> <li>Power steering</li> <li>Power steering</li> <li>Power seats</li> <li>Steering adjustment</li> <li>Central locking</li> <li>Defogger (rear)</li> <li>Remote boot/ fuel-lid</li> <li>Power window</li> <li>Alloy wheels</li> <li>Tubeless tyres</li> <li>Sun – roof</li> <li>Front fog lights</li> <li>Rear wash wiper</li> </ul>	<ul style="list-style-type: none"> <li>√</li> <li>√</li> <li>√</li> <li>-</li> <li>-</li> <li>-</li> <li>√</li> <li>-</li> <li>√</li> <li>√</li> <li>-</li> <li>-</li> <li>√</li> <li>-</li> <li>√</li> <li>-</li> <li>√</li> <li>-</li> <li>-</li> <li>-</li> </ul>



	Anti-lock braking system	-
	Driver air-bags	-
	Passenger air-bags	-
	Immobilizer	-
	Traction control	-
	Child safety locks	-



# MARUTI

MODEL	A-star (VXi) petrol	
COST	3,96,169	
MILEAGE	19.5 kmpl	
SERVICING FACILITIES	457 dealerships in 253 cities across India	
COMFORT AND CONVIENCE	<ul style="list-style-type: none"> <li>Cup-holders</li> <li>Folder rear seat</li> <li>Tachometer</li> <li>Leather seats</li> <li>AM/FM radio</li> <li>CD player</li> <li>Air conditioner</li> <li>Power door locks</li> <li>Power steering</li> <li>Power steering</li> <li>Power seats</li> <li>Steering adjustment</li> <li>Central locking</li> <li>Defogger (rear)</li> <li>Remote boot/ fuel-lid</li> <li>Power window</li> <li>Alloy wheels</li> <li>Tubeless tyres</li> <li>Sun – roof</li> <li>Front fog lights</li> </ul>	<ul style="list-style-type: none"> <li>√</li> <li>-</li> <li>-</li> <li>-</li> <li>√</li> <li>√</li> <li>√</li> <li>-</li> <li>-</li> <li>√</li> <li>√</li> <li>-</li> <li>√</li> <li>√</li> <li>-</li> <li>√</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul>

	Rear wash wiper	-
	Anti-lock braking system	-
	Driver air-bags	-
	Passenger air-bags	-
	Immobilizer	√
	Traction control	-
	Child safety locks	√

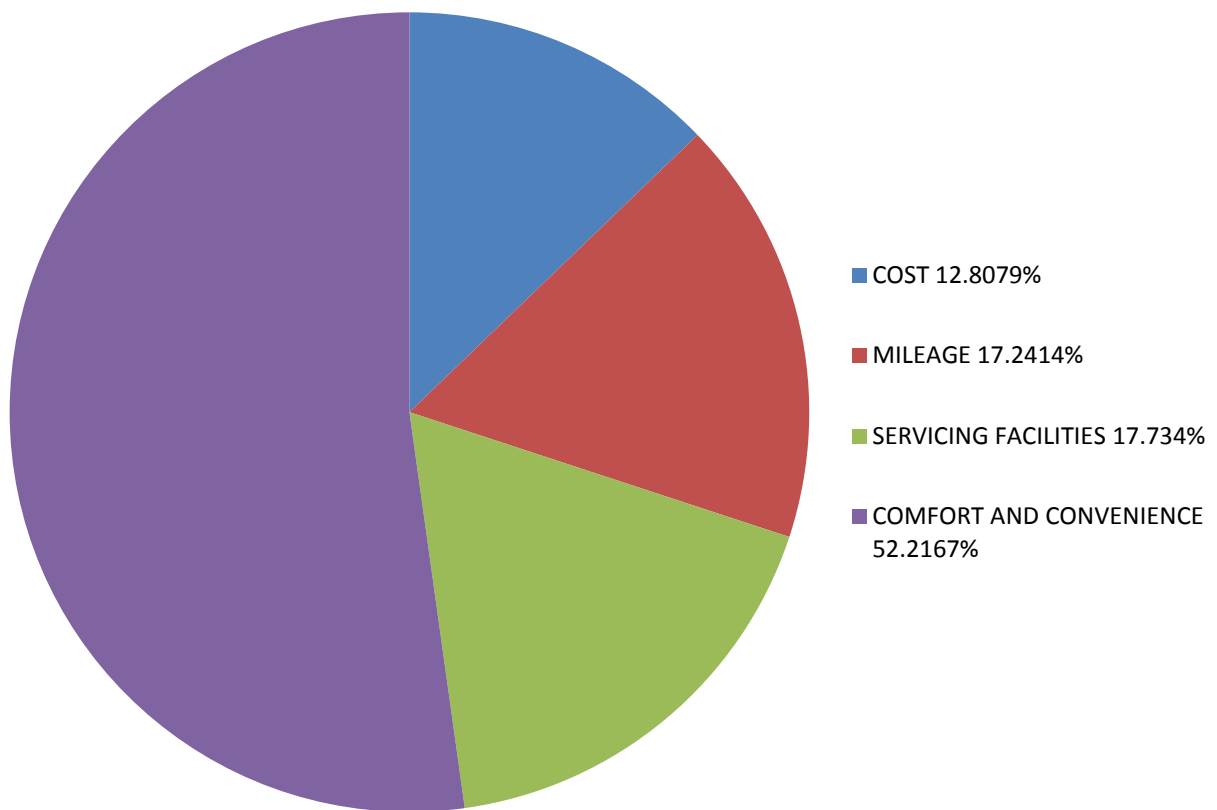


	Tubeless tyres	√
	Sun – roof	-
	Front fog lights	-
	Rear wash wiper	-
	Anti-lock braking system	√
	Driver air-bags	-
	Passenger air-bags	-
	Immobilizer	-
	Traction control	-
	Child safety locks	-
		-
		√
		-
		-

## VOTES FOR CRITERIA

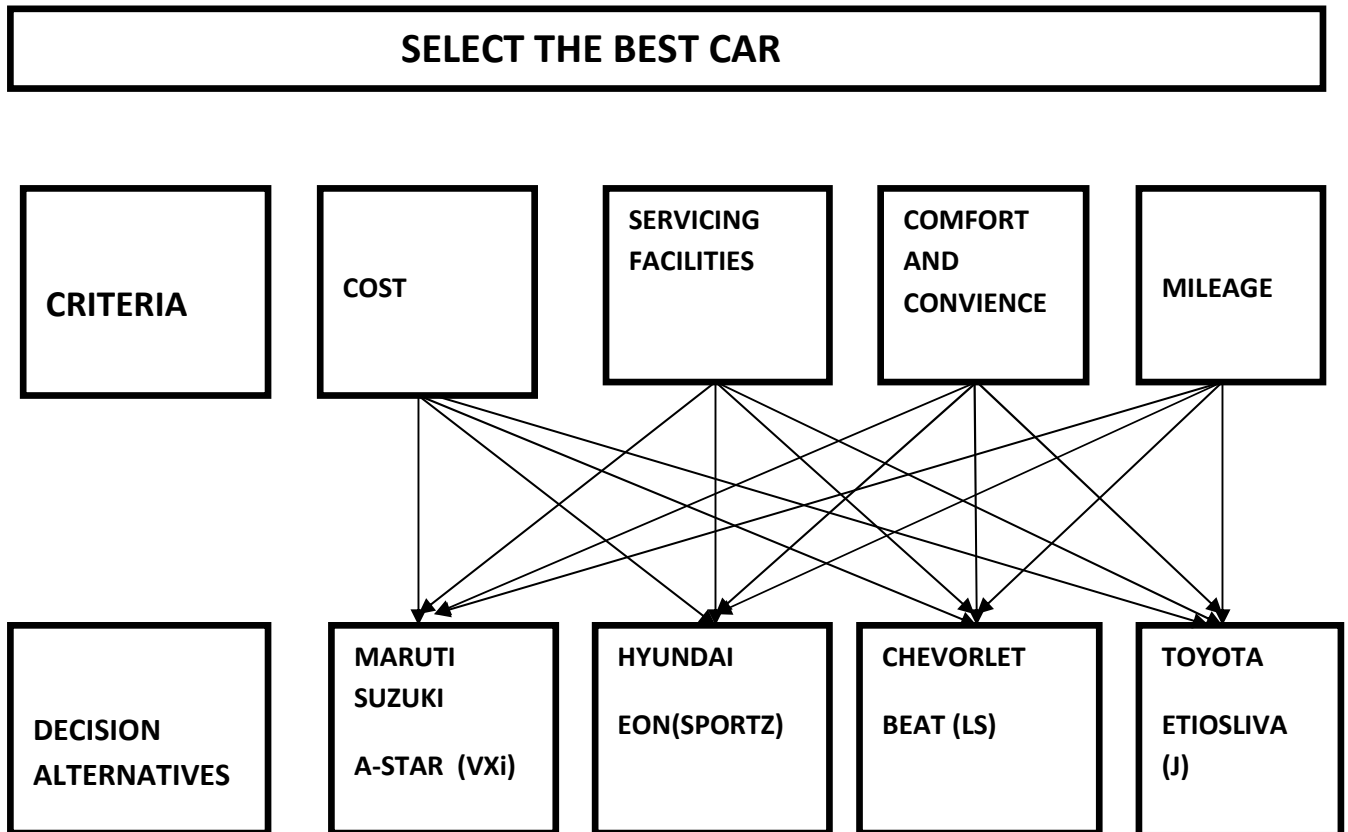
Quantitative information from survey voting

### % PERCENTAGE

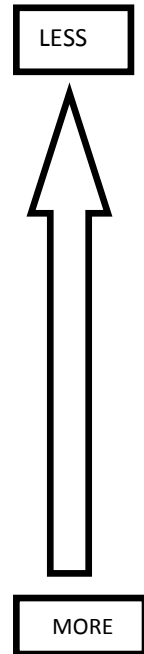
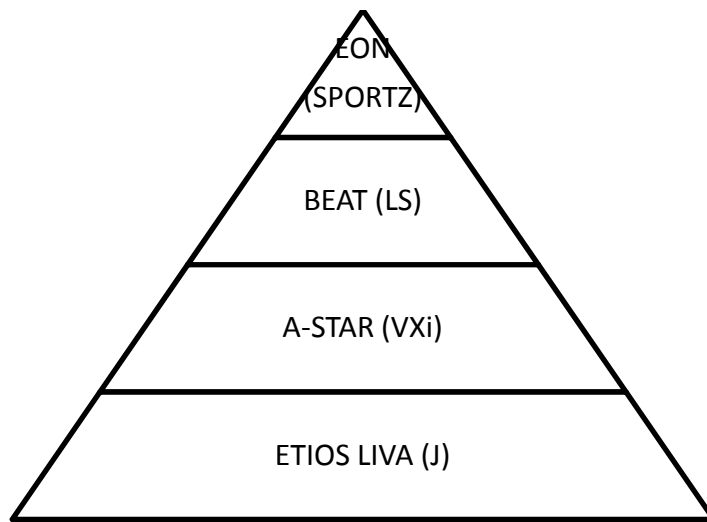


# Calculations:

## HIERARCHY FOR THE CAR SELECTION PROBLEM



**Cost:**



- **Forming a pair wise comparison matrix:**

In terms of price A-star is strongly preferred to Etios liva,

And Eon is very strongly to A-star and strongly to beat, extremely to Etios liva .

Now beat is very strongly preferred to Etios liva

- **Pair with comparison maruti for cost :**

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	1	1/7	1	5
EON (SPORTZ)	7	1	5	9
BEAT (LS)	1	1/5	1	7
ETIOS LIVA (J)	1/5	1/9	1/7	1



- **Normal maruti for cost :**

Divide each entry in the pair wise comparison matrix by its corresponding column sum.

For example:  $(1+7+1+1/5) = 46/5$

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA(J)
A-STAR (VXi)	5/46	45/458	7/50	5/22
EON (SPORTZ)	35/46	315/458	35/50	9/22
BEAT (LS)	5/46	63/458	7/50	7/22
ETIOS LIVA (J)	1/46	35/458	1/50	1/22

- **Priority vector for cost :**

The priority vector is determined by averaging the row entries in the normalised matrix.

Converting to decimal we get,

$$\text{A-STAR (VXi): } (5/46 + 45/458 + 7/50 + 5/22)/4 = \boxed{0.1435}$$

$$\text{EON (SPORTZ): } (35/46 + 315/458 + 35/50 + 9/22)/4 = \boxed{0.6394}$$

$$\text{BEAT (LS): } (5/46 + 63/458 + 7/50 + 7/22)/4 = \boxed{0.1761}$$

$$\text{ETIOS LIVA (J): } (1/46 + 35/458 + 1/50 + 1/22)/4 = \boxed{0.0409}$$

- **Checking consistency:**

Multiply each column of the pair wise comparison matrix by its priority.

$$\begin{array}{c} 0.1435 \\ \hline \begin{array}{c} 1 \\ 7 \\ 1 \\ 1/7 \end{array} \\ \hline \end{array} + 0.6394 \begin{array}{c} \hline \begin{array}{c} 1/7 \\ 1 \\ 1/5 \\ 1/9 \end{array} \\ \hline \end{array} + 0.1761 \begin{array}{c} \hline \begin{array}{c} 1 \\ 5 \\ 1 \\ 1/7 \end{array} \\ \hline \end{array} + 0.0409 \begin{array}{c} \hline \begin{array}{c} 5 \\ 9 \\ 7 \\ 1 \end{array} \\ \hline \end{array} = \begin{array}{c} \hline \begin{array}{c} 0.6154 \\ 2.8925 \\ 0.73378 \\ 0.1658 \end{array} \\ \hline \end{array}$$

- **Divide these no. by their priorities to get:**

$$0.6154/0.1435 = 4.2885$$

$$2.8925/0.6394 = 4.5237$$

$$0.73378/0.1761 = 4.1668$$

$$0.1658/0.0409 = 4.0537$$

- **Check consistency:**

$$\lambda^{\max} = (4.2885 + 4.5237 + 4.1668 + 4.0537)/4 = 4.2581$$

compute the consistence index, CI for 3 terms by

$$CI = (\lambda^{\max} - n) / (n-1)$$

$$\Rightarrow (4.2581-1)/(4-1)$$

$$\Rightarrow 0.0860$$

Compute the consistency ratio, CR by CI/RI,

Where,

$$RI = 0.90 \text{ y } n = 4$$

Where, n= no. Of alternatives

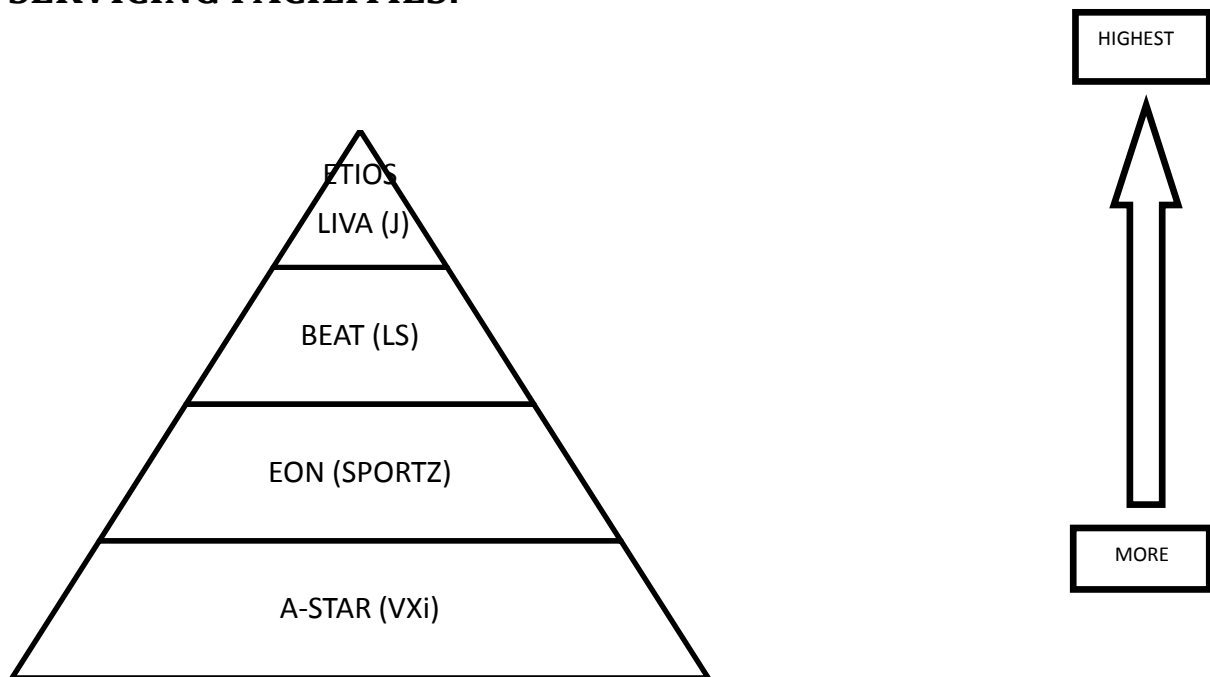
$$CR = CI/RI$$

$$\Rightarrow 0.0860/0.90$$

$$\Rightarrow 0.0955$$

Since, the consistency ratio, CR is less than 0.10, this is well within the acceptable range for consistency.

## SERVICING FACILITIES:



- **Forming a pair wise comparison matrix:**

In term of servicing facilities Maruti is strongly preferred to Hyundai and very strongly preferred to Chevrolet and extremely to Toyota  
 Now, Hyundai is moderately preferred to Chevrolet and strongly to Toyota  
 And also Chevrolet is equally preferred to Toyota  
 Toyota is equally preferred to Chevrolet.

- **Pair wise comparison matrix for servicing facilities:**

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS	LIVA (J)
A-STAR (VXi)	1	5	7	9	
EON (SPORTZ)	1/5	1	3	5	
BEAT (LS)	1/7	1/3	1	1	
ETIOS LIVA (J)	1/9	1/5	1	1	

- **Normalised matrix for servicing facilities:**

Divide each entry in the pair wise comparison matrix by its corresponding column sum.

For example: for Cornell sum =  $1+1/5+1/7+1/9 = 458/315$

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	315/458	75/98	7/12	9/16
EON(SPORTZ)	63/458	15/98	3/12	5/16
BEAT(LS)	45/458	5/98	1/12	1/16
ETIOS LIVA(J)	35/458	3/98	1/12	1/16

- **Priority vector for servicing facilities:**

The priority vector is determined by averaging the row entries in the normalised matrix. Converting to decimal we get;

$$\text{A-STAR (VXi): } ( 315/458 + 75/98 + 7/12 + 9/16 ) = \boxed{0.6497}$$

$$\text{EON (SPORTZ): } ( 63/458 + 15/98 + 3/12 + 5/16 ) = \boxed{0.2132}$$

$$\text{BEAT (LS): } ( 45/458 + 5/98 + 1/12 + 1/16 ) = \boxed{0.0737}$$

$$\text{ETIOS LIVA (J): } ( 35/458 + 3/98 + 1/12 + 1/16 ) = \boxed{0.0632}$$

- **Checking consistency:**

Multiply each column of the pair wise comparison matrix by its priority.

**Divide these no. By their priority to get:**

$$2.8004/0.6497 = 4.3102$$

$$0.88024/ 0.2132 = 4.1287$$

$$0.30078/0.0737 = 4.0811$$

$$0.2517/0.0632 = 3.9825$$

- **Check consistency:**

Average the above results to get  $\lambda^{\max}$ ;

$$\lambda^{\max} = (4.3102 + 4.1287 + 4.0811 + 3.9825)/4 = 4.1256$$

Compute the consistence index, CI, for 3 terms by

$$CI = (\lambda^{\max} - n) / (n-1)$$

$$\Rightarrow (4.1256-1)/(4-1)$$

$$\Rightarrow 0.0418$$

Compute the consistency ratio, CR by CI/RI

Where,

$$RI = 0.90 \text{ y } n = 4$$

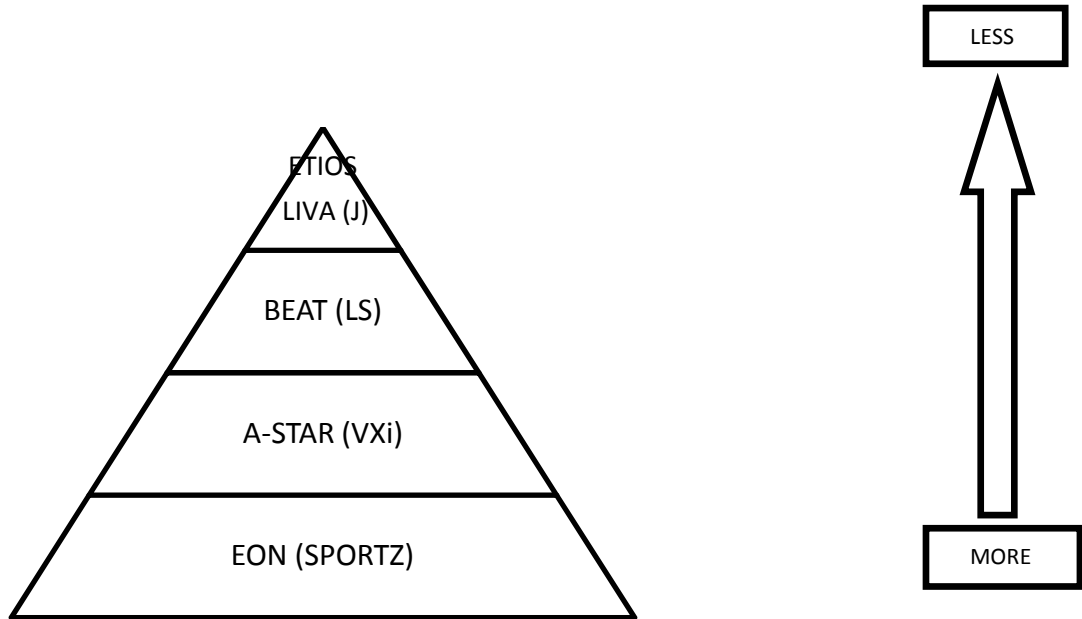
Where, n= no. Of alternatives, CR = CI/RI

$$\Rightarrow 0.0418/0.90$$

$$\Rightarrow 0.046$$

Since, the consistency ratio, CR is less than 0.10, this is well within the acceptable range for consistency.

## COMFORT AND CONVENIENCE:



- **Forming a pair wise comparison matrix:**

In term of servicing facilities A-star(vxi) is equally preferred to beat (Ls) and preferred to moderately to Etios liva (J)

Now Eon (sportz) is strongly preferred to A-star (vxi) and very strongly to Beat (Ls)

And also extremely preferred to Etios liva

- **Pair with comparison comfort and convenience :**

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	1	1/5	1	3
EON(SPORTZ)	5	1	7	9
BEAT(LS)	1	1/7	1	3
ETIOS LIVA(J)	1/3	1/9	1/3	1

- **Normalised matrix for servicing facilities:**

Divide each entry in the pair wise comparison matrix by its corresponding column sum

For example:  $(1+5+1+1/3)=22/3$

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	3/22	63/458	3/28	3/16
EON(SPORTZ)	15/22	315/458	21/28	9/16
BEAT(LS)	3/22	45/458	3/28	3/16
ETIOS LIVA(J)	1/22	35/458	1/28	1/16

- **Priority vector for servicing facilities:**

The priority vector is determined by averaging the row entries in the normalised matrix.

Converting to decimal we get:

$$\text{A-STAR (VXi)} : ( 3/22 + 63/458 + 3/28 + 3/16 )/4 = 0.1421$$

$$\text{EON (SPORTZ)} : ( 15/22 + 315/458 + 3/28 + 3/16 )/4 = 0.6705$$

$$\text{BEAT(LS)} : ( 3/22 + 45/458 + 3/28 + 3/16 )/4 = 0.1323$$

$$\text{ETIOS LIVA(J)} : ( 1/22 + 35/458 + 1/28 + 1/16 )/ 4 = 0.055$$

- **Checking consistency:**

Multiply each column of the pair wise comparison matrix by its priority.

$$\begin{array}{c} 0.1421 \\ \begin{array}{|c|} \hline 1 \\ \hline 5 \\ \hline 1 \\ \hline 1/3 \\ \hline \end{array} \end{array} + 0.6705 \begin{array}{c} \begin{array}{|c|} \hline 1/5 \\ \hline 1 \\ \hline 1/7 \\ \hline 1/9 \\ \hline \end{array} \\ + 0.1323 \begin{array}{c} \begin{array}{|c|} \hline 1 \\ \hline 7 \\ \hline 1 \\ \hline 1/3 \\ \hline \end{array} \\ + 0.055 \begin{array}{c} \begin{array}{|c|} \hline 3 \\ \hline 9 \\ \hline 3 \\ \hline 1 \\ \hline \end{array} \end{array} = \begin{array}{c} \begin{array}{|c|} \hline 0.5735 \\ \hline 2.7966 \\ \hline 0.5351 \\ \hline 0.2209 \\ \hline \end{array} \end{array}$$

- **Divide these no. By their priority to get**

$$0.5735/0.1421 = 4.0358$$

$$2.7966/0.6705 = 4.1709$$

$$0.5351/0.1323 = 4.0445$$

$$0.2209/0.055 = 4.0163$$

- **Check consistency:**

Average the above results to get  $\lambda^{\max}$

$$\lambda^{\max} = (4.0358 + 4.1709 + 4.0445 + 4.0163)/4 = 4.066875$$

compute the consistency ratio, CI, for 3 terms by

$$CI = (\lambda^{\max} - n) / (n-1)$$

$$\Rightarrow (4.06687-1)/(4-1)$$

$$\Rightarrow 0.0222$$

Compute the consistency ratio, CR by CI/RI,

Where,

$$RI = 0.90 \text{ y } n = 4$$

Where, n= no. Of alternatives

$$CR = CI/RI$$

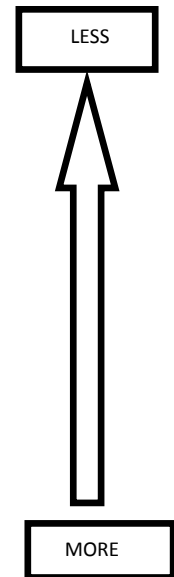
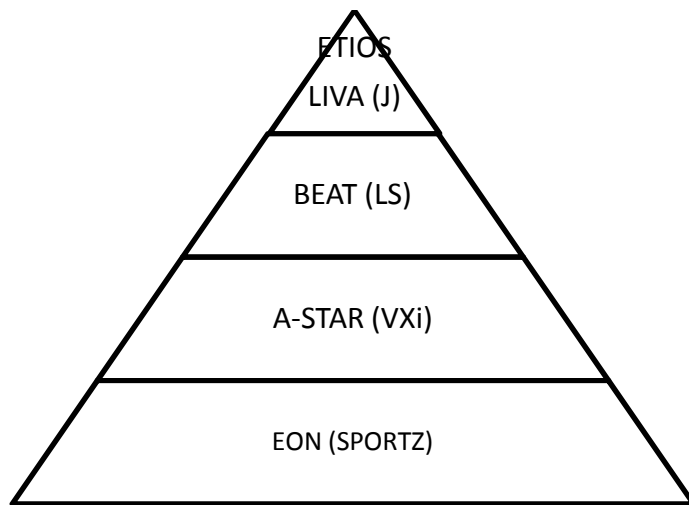
$$\Rightarrow 0.0247/0.90$$

$$\Rightarrow 0.0247$$

Since , the consistency ratio, CR is less than 0.10, this is well within the acceptable range for consistency.



**MILEAGE:**



- **Forming a pair wise comparison matrix:**

In term of mileage A-star(vxi) is equally preferred to Beat (Ls) and strongly preferred to Etiosliva (J)

Eon (sportz) is moderately preferred to A-star (vxi) and equally preferred to beat (Ls)

And also extremely preferred to Etios liva

Now beat (Ls) equally preferred to A-star (vxi), and moderately to etios liva (J).

- **Pair with comparison mileage :**

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	1	1/3	1	5
EON(SPORTZ)	3	1	1	7
BEAT(LS)	1	1/5	1	3
ETIOS LIVA(J)	1/5	1/7	1/3	1

- **Normalised matrix for mileage:**

Divide each entry in the pair wise comparison matrix by its corresponding column sum.

For example:  $(1+3+1+1/5)= 26/5$

	A-STAR (VXi)	EON (SPORTZ)	BEAT (LS)	ETIOS LIVA (J)
A-STAR (VXi)	5/26	35/176	3/22	5/16
EON(SPORTZ)	15/26	105/176	15/22	7/16
BEAT(LS)	5/26	21/176	3/22	3/16
ETIOS LIVA(J)	1/26	15/176	1/22	1/16

- **Priority vector for mileage:**

The priority vector is determined by averaging the row entries in the normalised matrix.

Converting .

$$\text{A-STAR (VXi): } (5/26 + 35/176 + 3/22 + 5/16)/4 = \boxed{0.2100}$$

$$\text{EON(SPORTZ): } (15/26 + 105/176 + 15/22 + 7/16)/4 = \boxed{0.5732}$$

$$\text{BEAT (LS): } (5/26 + 21/176 + 3/22 + 3/16)/4 = \boxed{0.1588}$$

$$\text{ETIOS LIVA (J): } (1/26 + 15/176 + 1/22 + 1/16)/4 = \boxed{0.0579}$$

- **Checking consistency :**

Multiply each column of the pair wise comparison matrix by its priority.

$$\begin{array}{r}
 0.2100 \begin{array}{|c|} \hline 1 \\ \hline 3 \\ \hline 1 \\ \hline 1/5 \\ \hline \end{array}
 + 0.5732 \begin{array}{|c|} \hline 1/3 \\ \hline 1 \\ \hline 1/5 \\ \hline 1/7 \\ \hline \end{array}
 + 0.1588 \begin{array}{|c|} \hline 1 \\ \hline 5 \\ \hline 1 \\ \hline 1/3 \\ \hline \end{array}
 + 0.0579 \begin{array}{|c|} \hline 5 \\ \hline 7 \\ \hline 3 \\ \hline 1 \\ \hline \end{array}
 = \begin{array}{|c|} \hline 0.8493 \\ \hline 2.4025 \\ \hline 0.65714 \\ \hline 0.2347 \\ \hline \end{array}
 \end{array}$$

- **Divide these number by their priorities to get:**

$$0.8493/0.2100 = 4.0442$$

$$2.4025/0.5732 = 4.1913$$

$$0.65714/0.1588 = 4.1381$$

$$0.2347/0.0579 = 4.0535$$

- **Check consistency:**

Average the above to get  $\lambda^{\max}$

$$\lambda^{\max} = (4.0442 + 4.1913 + 4.1381 + 4.0535)/4 = 4.1067$$

compute the consistence index, CI, for 3 terms by

$$CI = (\lambda^{\max} - n) / (n-1)$$

$$\Rightarrow (4.1067-1)/(4-1)$$

$$\Rightarrow 0.0355$$

Compute the consistency ratio, CR by CI/RI,

Where,

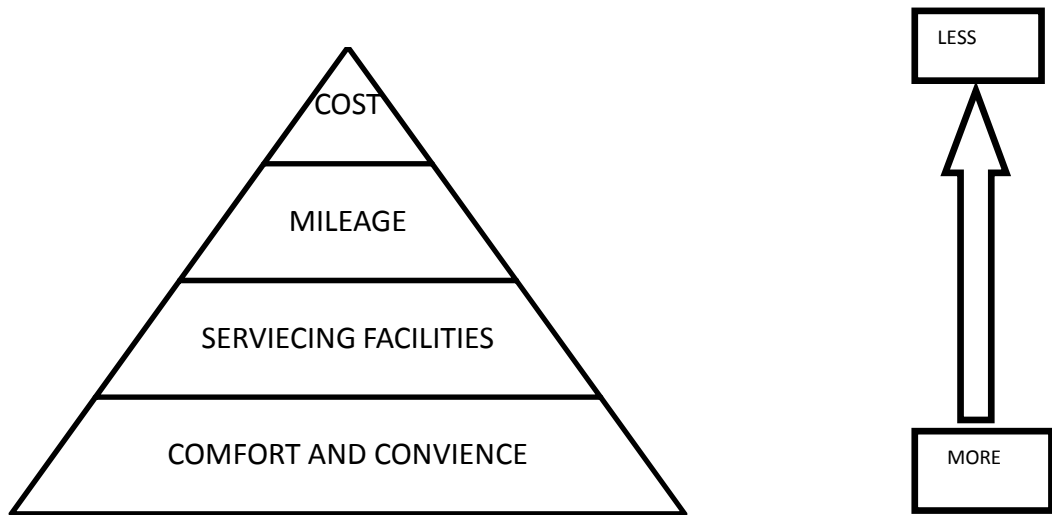
$$RI = 0.90 \text{ y } n = 4$$

Where, n= no. Of alternatives

$$CR = CI/RI$$

$$\Rightarrow 0.0355/0.90$$

$\Rightarrow 0.0395$ , since, the consistency ratio, CR is less than 0.10, this is well within the acceptable range for consistency.



As per rating from survey that in terms of criteria,  
 Mileage is moderately preferred to cost, and equally preferred to servicing facilities.  
 Servicing facilities is strongly preferred to cost, and equally to mileage.  
 Now, comfort and convenience is extremely preferred to cost, very strongly preferred to  
 mileage and servicing facilities.

- Pair wise comparison:**

	Cost	mileage	servicing facilities	comfort and convenience
cost	1	1/3	1/5	1/9
Mileage	3	1	1	1/7
Servicing facilities	5	1	1	1/7
Comfort and convenience	9	7	7	1

- **Normalised matrix :**

Divide each entry in the pair wise comparison matrix by its corresponding column sum.

	Cost	mileage	servicing facilities	comfort and convince
Cost	1/18	1/28	1/46	7/88
Mileage	3/18	3/28	5/46	9/88
Servicing facilities	5/18	3/28	5/46	9/88
Comfort and convince	9/18	21/28	35/46	63/88

- **Priority vector for criteria:**

The priority vector is determined by averaging the row entries in the normalised matrix.

Converting to decimal we get;

$$\text{Cost: } (1/18 + 1/28 + 1/46 + 7/88)/4 = \boxed{0.048}$$

$$\text{Mileage: } (3/18 + 3/28 + 5/46 + 9/88)/4 = \boxed{0.121}$$

$$\text{Servicing facilities: } (5/18 + 3/28 + 5/46 + 9/88)/4 = \boxed{0.148}$$

$$\text{Comfort and convince: } (9/18 + 21/28 + 35/46 + 63/88)/4 = \boxed{0.681}$$

- **Checking consistency:**

Multiply each column of the pair wise comparison matrix by its priority.

$$\begin{array}{c} 0.0481 \\ \\ \\ \end{array} \begin{array}{|c|} \hline 1 \\ \hline 3 \\ \hline 5 \\ \hline 9 \\ \hline \end{array} +0.1211 \begin{array}{|c|} \hline 1/3 \\ \hline 1 \\ \hline 1 \\ \hline 7 \\ \hline \end{array} +0.1489 \begin{array}{|c|} \hline 1/5 \\ \hline 1 \\ \hline 1 \\ \hline 7 \\ \hline \end{array} +0.6816 \begin{array}{|c|} \hline 1/9 \\ \hline 1/7 \\ \hline 1/7 \\ \hline 1 \\ \hline \end{array} = \begin{array}{|c|} \hline 0.1939 \\ \hline 0.5116 \\ \hline 0.6078 \\ \hline 3.0045 \\ \hline \end{array}$$

- **Divide these number by their priorities:**

$$0.1939/0.0481 = 4.0311$$

$$0.5116/0.1211 = 4.2246$$

$$0.6078/0.1489 = 4.0819$$

$$3.0045/0.6816 = 4.4080$$

- **Check consistency:**

Average the above results to get  $\lambda^{\max}$

$$\lambda^{\max} = (4.0311 + 4.2246 + 4.0819 + 4.4080)/4 = 4.1864$$

compute the consistence index, I, for 3 terms by

$$CI = (\lambda^{\max} - n) / (n-1)$$

$$\Rightarrow (4.1864-1)/(4-1)$$

$$\Rightarrow 0.0621$$

Compute the consistency ratio , CR by CI/RI,

Where,

$$RI = 0.90 \text{ } n = 4$$

Where, n= no. Of alternatives

$$CR = CI/RI$$

$$\Rightarrow 0.0621/0.90$$

$$\Rightarrow 0.0690$$

Since, the consistency ratio, CR is less than 0.10; this is well within the acceptable range for consistency.

• Overall priority vector:

Cost      mileage      servicing facilities      comfort and convnience

Priority vector For criteria	0.0481	0.1211	0.1489	0.6816
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A-start (vxi)	0.1435	0.2100	0.6497	0.1421
Eon (sportz)	0.6394	0.5732	0.2132	0.6705
Beat (Ls)	0.1761	0.1588	0.0737	0.1323
Etios liva(J)	0.0409	0.0579	0.0632	0.055

A-star( vxi)	$(0.0481 \times 0.1435) + (0.1211 \times 0.2100) + (0.1489 \times 0.6497) + (0.6816 \times 0.1421)$	=	0.2259
Eon( sportz)	$(0.0481 \times 0.6394) + (0.1211 \times 0.5788) + (0.1489 \times 0.2132) + (0.6816 \times 0.6705)$	=	0.5895
Beat (LS)	$(0.0481 \times 0.1761) + (0.1211 \times 0.1588) + (0.1489 \times 0.0737) + (0.6816 \times 0.1323)$	=	0.1288
Etios liva (J)	$(0.0481 \times 0.0409) + (0.1211 \times 0.0579) + (0.1489 \times 0.0632) + (0.6816 \times 0.055)$	=	0.0558

Thus,  
Hyundai Eon (sportz) is appears to be the overall best as per calculate

## CONCLUSION

After solving this car selection problem with AHP method I have found that Hyundai is overall the best available option. And buyer gets the maximum satisfaction with their decision if they purchases Hyundai Eon.

Caution: This research is done on non-profit basis, and to educate people how to make a decision, especially when it involves huge amount of money..