Analysis of
Buy a car

Table of contents

Summary

**BMW** is the best alternative, but not with a large margin.
There are no big differences between the alternatives.
No criterion is dominating the solution.
All criteria contribute to the solution.



Overview

This report considers the task
**Buy a car**

* The task proposes a number of **3** alternatives.
	+ **BMW**Rating: *0.341230*
	+ **Porsche**Rating: *0.332526*
	+ **Mercedes**Rating: *0.326244*
* A number of **4** criteria is considered for evaluation.
	+ **Price** [Euro]
	*The costs to buy the car*Weight: *0.400000*
	Has the highest weight and is most important.
	+ **Speed** [km/h]
	*The maximum speed the car is capable of*Weight: *0.300000*
	Is close to most important.
	+ **Sound** [dB]
	*The loudness of the car*Weight: *0.200000*
	Is around **1/2** important as the most important criteria.
	+ **Consumption** [l/100km]
	*The consumption of fuel*Weight: *0.100000*
	Is around **1/4** important as the most important criteria.
* The criteria are arranged in **2** groups.
	+ **Buy a car**Weight: *1.00000*
	Contains groups: *Fun*
	Contains criteria: *Price, Consumption*
	+ **Fun**Weight: *0.500000*
	Contains criteria: *Speed, Sound*
* Some criteria seem to be correlated.

Stability

Changing the weights of any criterion by **10**% does not change the ranking of alternatives.

Changing the weights of the following criteria by **50**% changes the ranking of alternatives:

* **Price** - best alternative not affected

Correlation

The following criteria seem correlated:

* **Price** with *Sound*
* **Speed** with *Consumption*
* **Consumption** with *Speed*
* **Sound** with *Price*

Distribution

The following values were given in probability distributions

|  |  |  |
| --- | --- | --- |
| Criterion | Alternative | Distribution |
| Price | Porsche | Triangular Distributionmin=60000.0max=90000.0mode=80000.0 |

Ensemble

Ensemble was calculated with **1000** sample counts.
For the defined distribution functions, the following ensemble values result:

* **BMW**
Mean: 0.341144
Std. Deviation: 0.00181626
Min: 0.336112
Max: 0.344606
Ranking: 891.0, 0.0, 0.0
* **Porsche**
Mean: 0.332719
Std. Deviation: 0.00408660
Min: 0.324929
Max: 0.344041
Ranking: 109.0, 0.0, 0.0
* **Mercedes**
Mean: 0.326137
Std. Deviation: 0.00227033
Min: 0.319847
Max: 0.330465
Ranking: 0.0, 0.0, 0.0