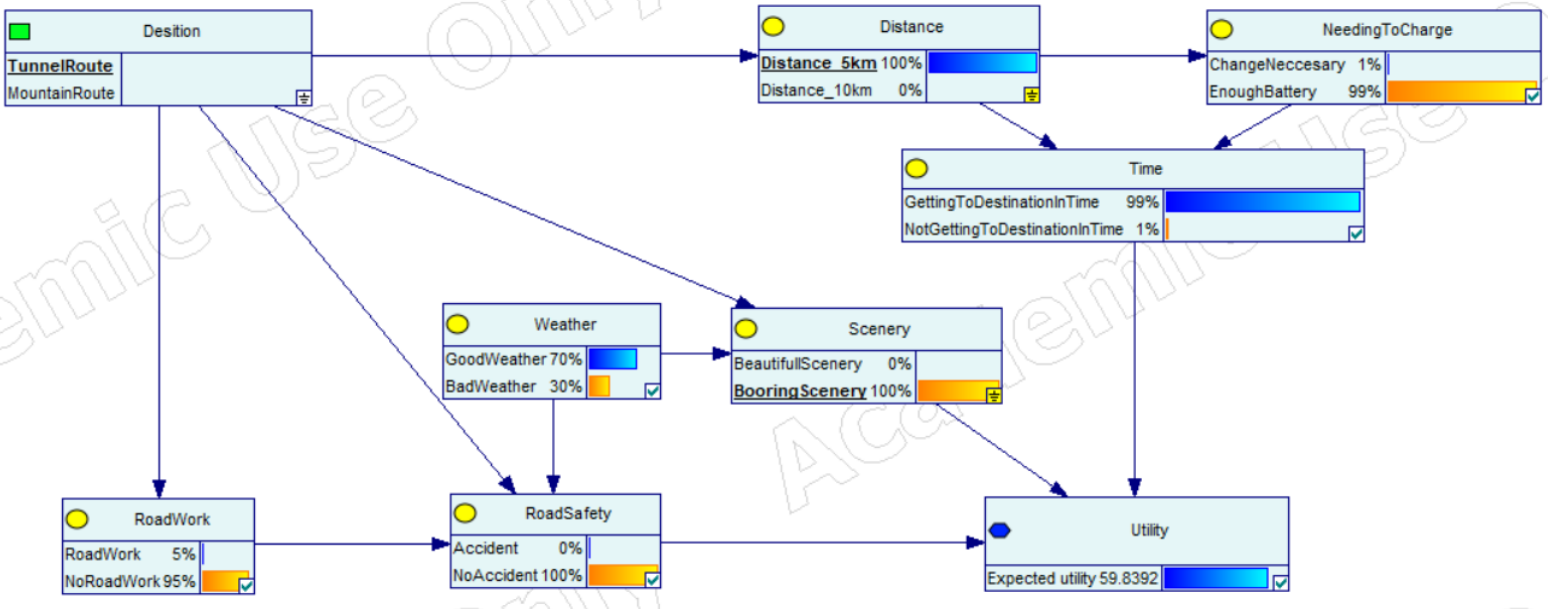
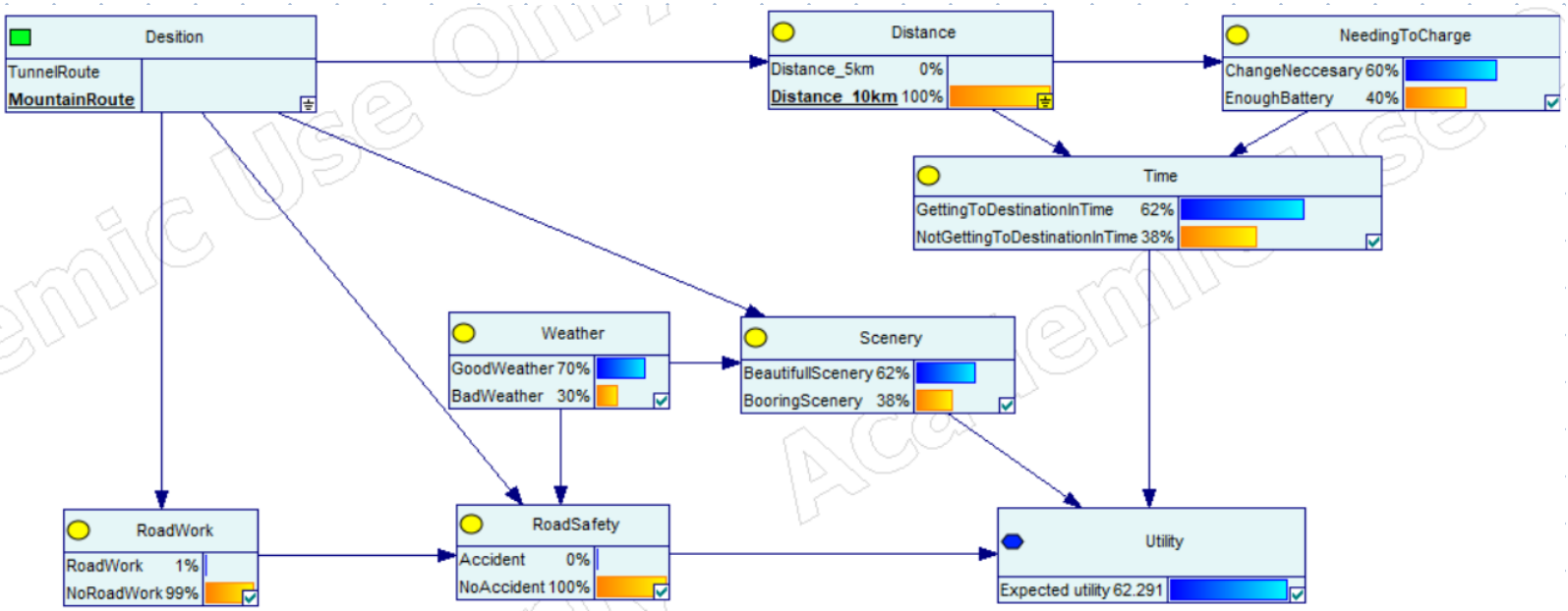
The non-trivial problem I have choosen is if I should drive my car over a mountain or through the mountain in a tunnel to get to my destination. The variables I have choosen together with their possible outcomes are;

- Distance (Distance5km, Distance10km) (certain)
- RoadWork (RoadWork, NoRoadWork) (uncertain)
- RoadSafety (Accident, NoAccident) (uncertain)
- Weather (GoodWeather, BadWeather) (uncertain)
- Scenery (Beautiful, Booring) (uncertain)
- NeedingToCharge (ChargeNeccesary, EnoughBattery) (uncertain)
- Time (GettingToDestinationInTime, NotGettingToDestinationInTime)v(uncertain)

The GeNIe Implementation and results given the different actions:



(Note; the chance of accident is not 0%, it´s just very low as seen in the probability table on the next page.)



The utility function;

Node properties: Utility

General | Definition | Format | User properties | Value

Time	GettingToDestinationInTime				NotGettingToDestinationInTime			
RoadSafety	Accident		NoAccident		Accident		NoAccident	
Scenery	BeautifullSc...	BooringSce...	BeautifullSc...	BooringSce...	BeautifullSc...	BooringSce...	BeautifullSc...	BooringSce...
Value	5	4	70	60	4	3	60	50

As seen in the Utility block, I have put a large value on not beeing in an accident. After that, the scenery is valued the most. Getting to the destination in time is not so important for me.

Probability tables that directly affect the utility function;

Node properties: Time

General | Definition | Format | User properties | Value

Distance	Distance_5km		Distance_10km	
NeedingToCharge	ChangeNeccesary	EnoughBattery	ChangeNeccesary	EnoughBattery
GettingToDestinationInTime	0.8	0.99	0.5	0.8
NotGettingToDestinationInTime	0.2	0.01	0.5	0.2

Node properties: Scenery

General | Definition | Format | User properties | Value

Desition	TunnelRoute		MountainRoute	
Weather	GoodWeather	BadWeather	GoodWeather	BadWeather
BeautifullScenery	0	0	0.8	0.2
BooringScenery	1	1	0.2	0.8

Node properties: RoadSafety

General | Definition | Format | User properties | Value

Weather	GoodWeather				BadWeather			
Desition	TunnelRoute		MountainRoute		TunnelRoute		MountainRoute	
RoadWork	RoadWork	NoRoadWork	RoadWork	NoRoadWork	RoadWork	NoRoadWork	RoadWork	NoRoadWork
Accident	0.002	0.0005	0.004	0.001	0.004	0.001	0.008	0.004
NoAccident	0.998	0.9995	0.996	0.999	0.996	0.999	0.992	0.996

Assumptions I have made;

- Firstly, I have assumed that all the values I have used in the model, is somehow know to me.
  Ex, Prob for bad or good weather from weather forcast
  Ex, Prob for RoadWork or NoRoadWork is an estimate based on my experience driving the different roads multiple times.
- The network is a simplification of the real world, but I have tried to include the most important factores.
- As seen in the picture from the network, I have made multiple conditional independance assumptions. (Ex, driving in bad weather does not affect my cars battery draining, which it obviously does in reality). I have tried to balance simplicity and ease of understanding the network with removing connections between things that affect each other in real life, but not to much, such that the end result of the utility function still is a good approximation of the "real" utility of the different choices.
- I have also made the assumptions such as getting to the destination in time beeing possible if there is an accident. I guess that depends on the severity of the accident and the possiblility of someone picking me up and driving me the rest of the way if the car becomes unusable.

End result;

The utility for driving over the mountain is slightly larger than driving in the tunnel through the mountain. This is mainly due to the large value I have put in seeing the potensially beautifull scenery that I won´t see if I drive through the tunnel.