Assignment 5

# Decision support system

## Problem

**The best way to arrive at campus at 08:15 am from Moholt, with the choices being**

* Take the bus that leaves at 07:42 am and arrive at 07:47 am
* Take the bus that leaves at 08:02 am and arrive at 08:07 am
* Start walking to campus at 07:45 and arrive at 08:11 am

**Variables:**

* Wake up time (uncertain): The time I woke up
* Traffic delay (uncertain): Traffic conditions which can slow down the bus
* Weather condition (uncertain): Weather conditions which can affect my chances of walking to campus (slippery conditions could discourage me), could also affect the bus estimated time.
* Travel time (uncertain): The time it takes to reach campus given a transportation method
* Mood (uncertain): Motivation and energy level in the morning.

**Assumptions and explanations:**

* The arrival time shown in the problem description are estimated arrivals (from ATB for buses and Google Maps for traveling on foot).
* Very cold in the morning and it feels even colder for someone as cold sensitive as me.
* The bus tends to be completely full in the morning around 8 am on Wednesdays because of students taking the course “Experts in Teams”. The 08:02 bus tends to have a higher probability of being full and leaving passengers onboard behind (the ones that could not squeeze in through the doors).
* My alarm is set at 7 am each morning.
* I am usually groggy in the morning because I don’t get enough sleep
* The travel time usually varies depending on the traffic, but it tends to arrive later than expected around 8am because of traffic.
* Wake up time is the time I get out of bed and not when I open my eyes.
* Although I have assumed the variables to be independent, some of them could influence each other. For example, wake up time affecting mood and vice versa. But for most days this should not be the case. Another one could be weather conditions affecting travel time, which I assume to not be the case because since the bus is driving in the city and in rush hour traffic (8 am) with a very slow speed, it should not considerably affect travel time.

**Model:**

**A diagram of a flowchart

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**Probabilities:**

* Weather condition

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* Day of the week

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* Traffic delay

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* Arrival time

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* Mood

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**Utilities:**

* Travel time utility



Since the table is too long, taking a screenshot through genie results in a very small and blurry screenshot. I will also hand in the GeNIe file so that it is easier to see the tables. The utility values shown in the table are the following (in the order shown in the picture).

Value 100 80 50 100 100 90 100 80 50 100 90 40 90 80 30 50 80 90 20 50 30 30 40 40 -100 -70 -25 -90 -60 -5 -100 -90 -50 -100 -80 -100

* Comfort utility

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Value 100 90 -100 90 80 -80 80 60 -70 100 100 -95 95 80 -90 90 70 -65 80 100 -100 80 100 -100 80 100 -100

**Result:**

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This aligns with the choices I make daily. Except “walking” should have been a bit lower as I hate walking downhill/uphill, but since it would be a good exercise, I have no excuse for lowering it down except for icy and rainy conditions (so I more or less agree with the value). I only take the bus that comes at 7:42 mostly on Wednesdays therefore I can understand why it scores lower. The bus at 08:02 am seems to be the best choice but it would be a terrible choice on Wednesdays but given that its only once a week I can see why it favors 08:02. I also had to cut out some variables because my tables were getting too large to fill out by hand, one of which was wake up time which would impact the final expected utility more realistically for all three transportation methods. Overall good results.