

# GWV – Grundlagen der Wissensverarbeitung

## Tutorial 3 : Searching

### Class Exercise 3.1 : (Scotland yard again)

In Scotland Yard, you can take taxis, busses, and subways to move around. Each time you use one of these, you have to pay one ticket that fits. Suppose you are Mister X. You have tickets for taxi, bus, and subway as well as black tickets which can be used for all three modes of transportation. The tickets differ in value (black > subway > bus > taxi).

1. Again, Mister X takes some steps and then the detectives do (and then the game is over). Find a way to escape the detectives and keep the best tickets. What kind of search would you use?
2. Suppose you had a fixed set of tickets and were tasked to go as far as possible from a given location (measured in centimeters on the board) using these tickets. How would you compute the best moves?

### Exercise 3.2 : (Blind Search)

```

XXXXXXXXXXXXXXXXXXXXX
X                    X
X          xxx       X
X        X xxxxx    X
X      s      X      X
X          x x      X
X        x x      xxxxxx
X   xx xxxxx      X
X      x          g  X
X          x        X
X          x        X
XXXXXXXXXXXXXXXXXXXXX

```

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The above figure shows an environment for a robot in an ASCII-Art representation. The robot starts in the field s (start) and wants to get to the field g (goal). The robot can move one field at a time in any of the four directions (up, down, left, right). The fields with an x denote a blocked field that the robot can not enter.

*This assignment teaches the basics of blind search strategies and should also familiarize you with the practical aspect of artificial intelligence, that is you get to write a small program.*

1. Build up an internal representation of the environment that is suitable for searching.
2. Your program should be able to read the ASCII labyrinths provided in the nats wiki.
3. The program should be able to display / print search states in some way.

Hand in the documented program code and a suitable human-readable output.