# Exercise 1

Papir

# Exercise 2

a)

**State representation**: Allowed states are given by the following rules.

* Peg1: {x0, x1..x} where xi is a disk
* Peg2: {y0, y1..y} where yi is a disk
* Peg3: {z0,z1..z} where zi is a disk
* {Peg1, Peg2, Peg3} = n, where n is the total set of disk.
* Peg1 union Peg2 union Peg3 = Ø

**Action representation**: Possible actions are given by the set *{1-to-2, 1-to-3, 2-to-1, 2-to-3, 3-to-1, 3-to-2}*, where *x-to-y* describes the movement of the top disk in peg x to the top of peg y

**States**: A state describes the location of each of the n disks on the three pegs, and their current order on each peg.

**Initial state**: All disks are placed in descending order, top to bottom, on the leftmost peg.

**Actions**: There are exists exactly six allowed actions. Different subset of these are allowed depending on the size of the disk moved and the top disk on selected peg.

**Result function (transition model)**: Given a state and action, this returns the resulting state; for example, if we apply 1-to-3

**Goal test**: This checks if only the third peg contains disk and they are in descending order.

**Path cost**: Each step costs 1, so the path cost is he number of steps in the path.

b)

c)

n^3?

# Exercise 3

a)

<f,g,h,s> = <estimated cost of cheapest solution(g+f), Path travelled, Optimistic (SLD), State>

|  |  |
| --- | --- |
| **Iteration** | **Fringe** |
| 0 | <244,0,244,L> |
| 1 | <311,70,241,M> <440,111,329,T> |
| 2 | <367,145,242,D> <440,111,329,T> |
| 3 | <425,265, 160,C> <440,111,329,T> |
| 4 | <606,413,193,R> <503,403,100,P> <440,111,329,T> |
| 5 | <606,413,193,R> <503,403,100,P> <595,229,366,A> |
| 6 | <606,413,193,R> <504,504,0,B> <595,229,366,A> |

b)

**Path**: L -> M -> D -> C -> P -> B

# Exercise 4