Assignment 3: Planning

## Due Sunday, 26 December 2021, 11pm

Action (or task) planning   Consider the Crazy Frog puzzle:

> A little frog is located in an $n \times n$ land, with few obstacles and a lot of insects. The frog can jump in any length in four cardinal directions and cannot land on any obstacles or already visited places. The frog eats insects whenever it lands on them. The goal is to eat all insects in the land.

The input corresponds to a $n \times n$ grid where F specifies the initial location of the frog, 0's denote insects and 1's denote obstacles.

For example, the sample input on Figure 1a, corresponds to the land specified in Figure 1b:

```
0 0 0 0 1
1 0 1 1 0
0 0 0 0 1
0 F 0 0 0
0 0 0 0 0
```

(a) Sample input
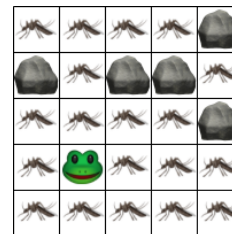
(b) Sample land

Formalize the domain above in STRIPS or ADL, prepare two different instances of the puzzle and use the planner FASTDOWNWARD[1] to solve your instances.

Submit the STRIPS/ADL description of the domain (i.e., operators) presented to the planner, corresponding planning problems of your instances, and the input and output of the planner.

Motion planning   Listen to Lydia Kavraki's talk at

    `https://ieeetv.ieee.org/planning-in-robotics-and-beyond-icra-2020`

and submit a pdf copy of your answers to the following questions:

a) What is motion planning?

b) How is motion planning different from task planning?

c) Describe three sample real-world applications of motion planning mentioned in the talks.

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[1]`http://www.fast-downward.org/`