

Homework 3: Planning (due November 1 before class)

Please read the rules for assignments on the course web page (<http://www.cs.duke.edu/courses/fall17/compsci570/>). Use Piazza (preferred) or directly contact Shuzhi (shuzhiyu@cs.duke.edu), Rui-Yi (ryzhang@cs.duke.edu), or Vince (conitzer@cs.duke.edu) for any questions.

In the course directory you can find the fast-forward planner (`ff`) as well as a “family domain” (`family-domain.pddl`), and some example problem instances: `family-1.pddl` asks for a plan to create a daughter, `family-2.pddl` asks for a plan to create an individual who is his own uncle, and `family-3.pddl` asks for a plan to create an individual who is his own father. As they say, “Don’t try this at home!” – but do read these files and call the planner on them to see what happens, e.g.,

```
./ff -o family-domain.pddl -f family-1.pddl
```

1 (50 points). Use the `ff` solver to find a plan to create an individual who is his own granduncle. (x is a granduncle of y if x is an uncle of a parent of y .) To do so, you should first **extend** `family-domain.pddl` to include a new predicate `is-granduncle-or-grandaunt-of` and a new action `conclude-granduncle-grandaunt`. Then, **create** a new problem instance `family-4.pddl` that asks for a plan to create an individual who is his own granduncle, and **run** the `ff` solver on it to produce an output file. Make sure to allocate enough objects (individuals who are not yet born). Finally, briefly **describe** the output plan in English.