

For all following problems, unless otherwise noted, file names refer to classical domains from the classical planning domains repository of <http://planning.domains> available here: <https://bitbucket.org/planning-researchers/classical-domains/src/master/classical/>

1. **Elevator Domain:** Open the domain file `elevators-00-strips/domain.pddl`. Then open `elevators-00-strips/s10-0.pddl` and solve the relaxed problem (without negative effects). How many steps did you need? (Note: You only have to find *a* solution, it does not have to be the optimal one)

2. **Elevator Domain:** Open the domain file `elevators-00-strips/domain.pddl`. Then open `elevators-00-strips/s2-3.pddl` and calculate the HSP heuristic value for all atoms. What is the heuristic value of the goal?

3. **Elevator Domain:** Open the domain file `elevators-00-strips/domain.pddl`. Then open `elevators-00-strips/s2-3.pddl` and calculate the FastForward heuristic value for the goal. Does it differ from the HSP heuristic value?

4. **HSP Heuristic:** Slide 19 states that the HSP Heuristic is not admissible. Define a planning domain and problem in which it overestimates the length of a plan by at least a factor of 2 (e.g. if the length of the plan is 4, the HSP heuristic value is at least 8).

5. **Elevator Domain:** Open the domain file `elevators-00-strips/domain.pddl`. Then open `elevators-00-strips/s30-1.pddl`. How long is the plan for this problem? Provide your best estimate for upper and lower bounds (hint: use landmarks).