

# PDDL

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This assignment is **individual**.

**Deadline:** The deadline is **Friday, December 23rd 2022, 16:59 sharp**.

**Submission:** Please, submit your solution in Canvas as a single text file.

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# PDDL

In this exercise, we are going to look into encoding a planning domain using PDDL. The syntax used is standardized, and more information is available online. For example in the [planning.wiki\[1\]](http://planning.wiki[1]). For this course we limit the scope to include the following material. For the domain you should familiarize yourself with predicates and actions. And related to the problem you should look into objects, initializations, and goals. The logic keywords you will need for this assignment are limited to "and" and "not". You can utilize this [online solver\[2\]](#) in order to check your solutions.

## 1 THE ASSIGNMENT

For this exercise let's suppose that you are the inn-keeper of a tavern in a small town. Once a year during the fall festival, the usually quiet town receives a large influx of travelers from all across the country. All guests who visits your inn have to sign the guest book for tax purposes. After the lively festival had transpired and you finally sat down for a well-deserved rest, you notice the guest book is missing. Following a trail of ripped and torn pages you arrive at the mangled remains of your guest book next to the sleeping tavern dog. OH NO! And the tax-man is scheduled to arrive tomorrow. Luckily you are proficient with PDDL, and set out to simulate the passed festival in order to rewrite the guest book.

### 1.1 THE TAVERN DOMAIN

You begin by creating the domain of the problem. Here you define the relevant information for the task, as well as how the world state can be changed. Download **domain.pddl** and **problem.pddl** from Canvas. For this task you will have to complete the code for all the actions in the domain file. The actions are all given with a comment that gives detailed instructions on how they should function. All the predicates you need to use are already defined in the domain, and you are not allowed to add new ones. Remember to verify the type of objects in the preconditions.

The actions which you will have to edit are:

- **Check in** - a party with a reservation checks into the tavern
- **Vacate** - a party vacates the room in which they spent the night
- **Clean room** - an empty room is cleaned
- **Next day** - continue to the next day in the guest book

The problem file includes an example problem definition. You can test your finished domain using the above mentioned [online solver\[2\]](#) and the given problem. Verify that the solver finds a solution to the problem. And submit your completed domain as **domain.pddl** in the PDDL1.1 assignment.

## 1.2 THE FESTIVAL PROBLEM

With the domain successfully completed you now switch your focus to the festival problem. The given **problem.pddl** will need to be expanded to reflect a set of objects, initial conditions, and goals. Some of the objects and initial conditions are found in Table 1.1. Apart from what is shown in the table you will have to create four generic parties of varying size matching the four rooms. These will be used to fill in the blanks in the guest book. The four days progress as you would expect. And sizes fits inside themselves and larger sizes.

Your goal is that all parties with reservations are booked for their corresponding day. And that all of the four rooms are booked for all of the four days.

		🛏 Room			
		🛏 suite	🛏 cellar	🛏 regular	🛏 deluxe
📏 Size		📏 small	📏 medium	📏 medium	📏 large
📅 Reservations	📅 thursday	👥 livingstone			
	📅 friday	👥 livingstone	👥 mardi_gras		👥 vox_machina
	📅 saturday	👥 livingstone	👥 mardi_gras	👥 friends	👥 the_fellowship
	📅 sunday				

Table 1.1: Table showing the available rooms and their corresponding size. As well as all the reservations of the given parties.

Verify that the solver[2] finds a solution to the problem. And submit your expanded problem as **problem.pddl** in the PDDL1.2 assignment.

## REFERENCES

- [1] A PDDL wiki, <https://planning.wiki/ref/pddl>, Accessed: 2022-10-06
- [2] An online PDDL editor and solver, <http://editor.planning.domains/>, Accessed: 2022-10-06