Important Note: Students must work individually on this, and other CMPT 310, assignments. You may not discuss the specific questions in this assignment, nor their solutions with any other student. You may not provide or use any solution, in whole or in part, to or by another student.

You are encouraged to discuss the general concepts involved in the questions in the context of completely different problems. If you are in doubt as to what constitutes acceptable discussion, please ask!

1. (3 marks) Exercise 7.1, page 279, Russell and Norvig. (For this, please represent the set of models using a table.)

2. (2 marks) Exercise 7.18, page 283, Russell and Norvig.

3. (5 marks) Consider the problem of devising a plan for a kitchen-cleaning robot.

   You are given the following considerations:

   (a) Cleaning the stove or the refrigerator will get the floor dirty.
   (b) The stove must be clean before covering the drip pans with foil.
   (c) Cleaning the stove generates garbage and messes up the counters.
   (d) Washing the counters or the floor gets the sink dirty.

   Identify a set of predicates to describe this domain, and write a set of PDDL-style operators that might be used to specify the actions. As well as formally specifying these operators you should also explain informally what each does.

   Write a description of the initial state of a kitchen that has a dirty stove, refrigerator, counters, and floor. The sink is clean and the garbage has been taken out. Also write a description of the goal state where everything is clean, there is no trash, and the stove drip pans have been covered in foil.

   Last, specify a plan, given by a sequence of actions, that will take you from the initial state to the goal state.