Applied Artificial Intelligence, Assignment 2

Write a Prolog program to drive a vehicle. You have the following facts to use as “data”

* F1: you are traveling below the speed limit
* F2: you are traveling at the speed limit
* F3: you are traveling above the speed limit
* F4: you are on a two-lane road
* F5: you are on a four-lane road
* F6: you see an intersection coming up
* F7: a car is less than 100 meters in front of you
* F8: the road changes from two-lane to four-lane shortly
* F9: the road will change from four-lane to two-lane shortly
* F10: the brake lights of the car in front of you are on
* F11: you are getting closer to the car in front of you
* F12: you are passing another car going in the same direction

Assume the only actions are

* C1: speed up
* C2: slow down
* C3: maintain speed
* C4: pass a car in front of you (or keep passing one you are passing)

Here are examples of what you want the program to do. (These would not make good rules – they are too specific)

* F2, F4, F6: slow down (C2)
* F2, F5, F8, F10: slow down (C2)
* F2, F5, F11: pass (C4)
* F1, F5: speed up (C1)
* F3, F4, F7: slow down (C4)

Write a Prolog program that can decide what to do for every possible combination of the facts. (Since there are 12 kinds of fact, you must handle 2^12 or 4096 different situations, but please note that some contradictory facts cannot all be true (or false) at the same time). Assume your program is called every second to decide what to do that second.

Choose a good control structure and discuss (justify) your ordering of rules.

Submit your program together with a 1 page description of the control structure used and a justification of the set, and order of, the rules.

Try to drive safely