Assignment: Control Satisfaction Problem

Suppose you need to develop a timetable for a semester. There is a list of subjects, a set of possible time slots for each subject and a set of rooms. Some subjects are compulsory while some are optional. Following are the constraints to satisfy.

1. A given subjects can be assigned only to one of the possible time slots given for that subject.
2. Two compulsory subjects cannot be in the same time slot (optional subjects may).
3. Two subjects cannot be assigned to the same room if they are assigned to the same time slot.

You need to assign each subject a time slot and a room.

1) Explain how you would model this as a constraint satisfaction problem.
2) Write a program to take a comma separated values (CSV) file of the form given below as input and output a CSV file of the form given below. Submit your source code and exe file. Your program should take two command line arguments; <input_file_name> and <output_file_name>

Input.csv

```
Subject_1, c, M1, M3, Tu2
Subject_2, o, Tu1, W1, Th2
Subject_3, c, M1, M3, W1
.
.
.
Subject_n, o, M3, Th2
R1, R2, R3
```

1st column: subject name
2nd column: c- compulsory, o-optional
3rd column onwards: possible time slots M1 - Monday slot 1, M3 - Monday slot 3, Tu2 - Tuesday slot 2 etc.
R1, R2, R3 … are available rooms in the department.

Output.csv

```
Subject_1, M1, R1
Subject_2, Tu1, R3
Subject_3, M3
.
.
.
Subject_n, Th2, R1
```