**HW 5**

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**Constraint Satisfaction Problems**

ITS 265 – Introduction to Artificial Intelligence

1. Give a precise formulation (variables, domains, and constraints) of the following constraint satisfaction problem:

(a) Class scheduling: There is a fixed number of professors and classrooms, a list of classes to be offered, and a list of possible time slots for classes. Each professor has a set of classes that he or she can teach.

**Solution:**

Variables are: Professors be *P*, Subjects be *S*, Classrooms i and Time slots j.

Let us assume two constraints matrix *Pij* and *Si*j.

*Pij* represents a professor in the classroom *i* at time *j*, similarly, *Sij* represents a subject taught in the classroom *i* at time *j*.

The set of professors is the domain of each *Pij*.

And a set of subjects is the domain of each *Sij*.

The constraints are: Pij != Pkj , k != i

Which enforces that no teacher is assigned to two classes that take place at the same time

Constraint between every professor *Pij* and subjects *Sij* denoted Cij(p,s).

In general,

**C(Pij,Sij) = {(p,s) | professor p can teach subject s}**