Assignment 2: Constraint Satisfaction Problems

Submission: Friday 07/09/2018 23h moodle

Groups of maximum 2 students

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You are a famous entrepreneur of USTAcapital. You are opening a new dependency, which requires the development of a supply chain. You have defined five workstations, which needs the good/service from the previous one. The workstations are: farming, design, manufacturing, packaging, and transportation.

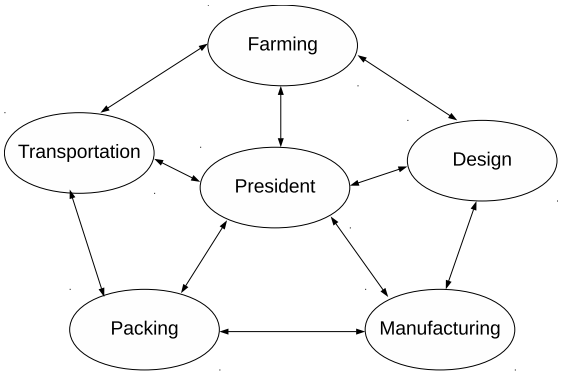

Figure 1: Relationship between workstation and president of USTAcapital

You have 5 people available to be the chief of each workstation (no one can be the chief of two or more stations). However, they can be extremely arrogant with some of each other. You, as president of USTAcapital, want to guarantee harmonious relationships between consecutive workstations. The head of human resources have brought you the following chart that shows the level of compatibility between your personal:

		To					
		You	**Mike**	**James**	**Emily**	**Tom**	**Amy**
From	**You**	☻	☻	☻	☻	☻	☻
	Mike	☻	☻	☹	☻	☻	☻
	James	☻	☻	☻	☻	☹	☻
	Emily	☻	☻	☻	☻	☹	☹
	Tom	☻	☻	☹	☻	☻	☻
	Amy	☻	☹	☻	☹	☻	☻

Table 1: Level of compatibility between personal

1. (10%) Formulate as a CSP problem. Define variables, domains and constraints.

2. (90%) Code in Python your own version of backtrack-search to solve this CSP problem. It is obligatory to verify the arc consistency every time the algorithm is trying to make a new assignment. Remember to reduce the domains of the variables involved in the arcs of the current variable.

In each iteration the algorithm has to append in a file the current parcial assignment and the domain of each variable. For example:

```
    Backtrack 1:
CSP with assignment:  {'Farming':  'James'}
Farming -> ['James']
Design -> ['Mike', 'Emily', 'Tom']
Manufacturing -> ['Mike', 'James', 'Emily', 'Tom', 'Amy']
Packing -> ['Mike', 'James', 'Emily', 'Tom', 'Amy']
Transportation -> ['Mike', 'Emily', 'Tom']
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```

Lastly, print the final and consistent assignment that your algorithm has found.

```
CSP with final assignment:  {'Farming':  'James' ...}
```

Submission

The python file has to be named `csp.py` and the output file `outputCSP.log`.
Compress your files in a .zip or .tar.gz