5CCS2INT – Introduction to Artificial Intelligence

EU Economics domain – modelling a basic economic environment with PDDL

Luca-Dorin Anton: k1764103 - 1710700

Horia Tudor Pavel-Simon: k1763970 - 1731038

**Description**

We have modelled the basic EU structure with six countries. Extending the number of countries results in different behaviour, so our approach is characterised by adding one country at a time and observe the changes. As the number of countries increases, the planner needs more steps to compute the optimal solution. Trades between countries are made, economies and funds grow and hence the quality of life is boosted.

**Problem files**

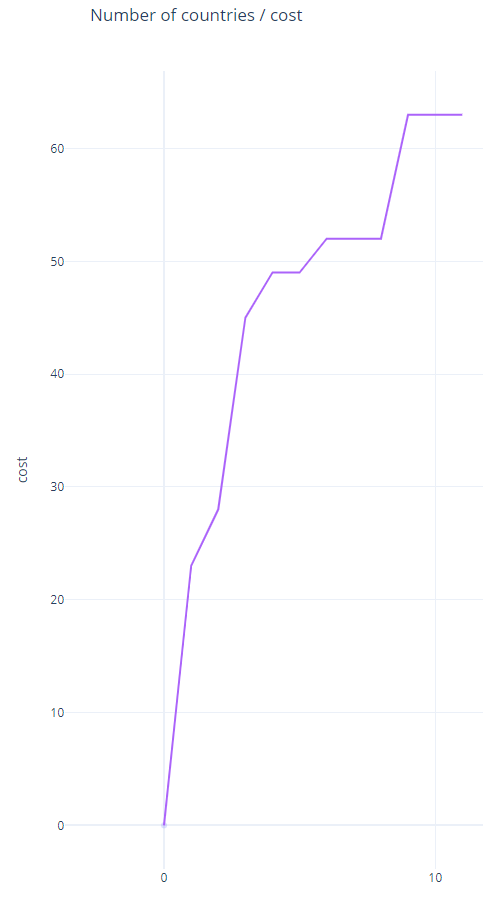
We defined a set of problem files, each one according to several countries in the European Union. Our problem file space includes eleven different challenges for the planner to solve. The problem files are sorted according to their difficulty.

**Planner**

We have used exclusively Optic for Windows. It gave us relevant and informative output for our problem files. For more information please refer to the *statistics* section below.

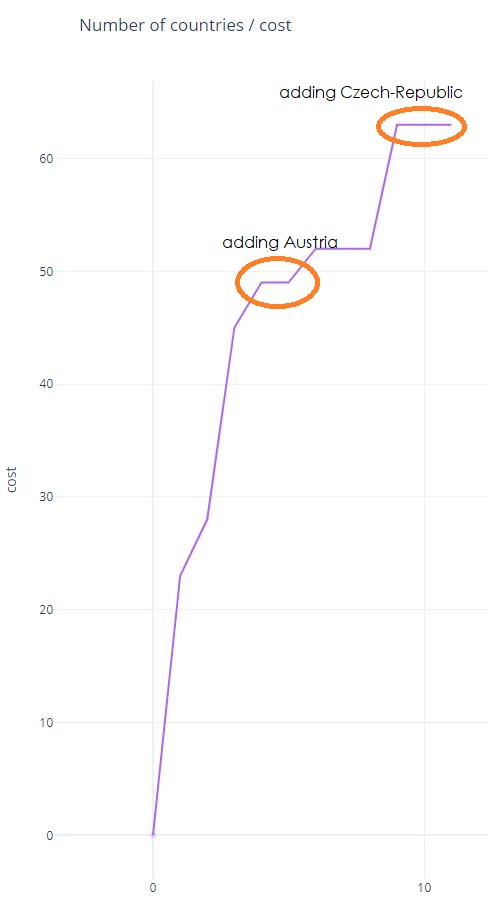
**Statistics**

This is the statistics section. We can observe that the cost increases with the number of countries. However, it has regions where it stagnates. This happens because in our domain, if there are more countries, this means more opportunities for trading, some of them resulting in lower prices and thus less overhead. Whenever the European Union grows in the number of countries, the economic & quality of life thresholds are achieved much more rapidly.

 As we can see in this figure the planner increases it’s cost of work only at times where the new country added creates overhead.

We say that a new country ‘helps’ the EU, if it’s inclusion in the economic area, doesn’t increase the overall cost of the algorithm.

This means that the new country added was the ‘best deal’ for that current state of the European Union.



***figure 1.***

As you can see from ***figure 2,*** including Austria and Czech-Republic will not affect the cost of achieving the desired result.

We call Austria and Czech-Republic to be ‘best deals’ at their time of inclusion in the EU.

***figure 2.***