CSE537 Fall 2019 Artificial Intelligence Homework3

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1. **Strategy**
   In this project, we need to find all the possible solutions. Then compare them with each other to select the minimum cost solution.

   Firstly, I use findall function in prolog to get all the combination of all packages. During the process of finding each combination, I will check whether it can satisfy the total need and max accepted offer. Only these solutions which can satisfy both constraints can be added to the possible solutions list in prolog.

   After finding all the possible solutions, I just need to calculate the cost of each solution and select the minimum cost solution.

2. **Implementation**

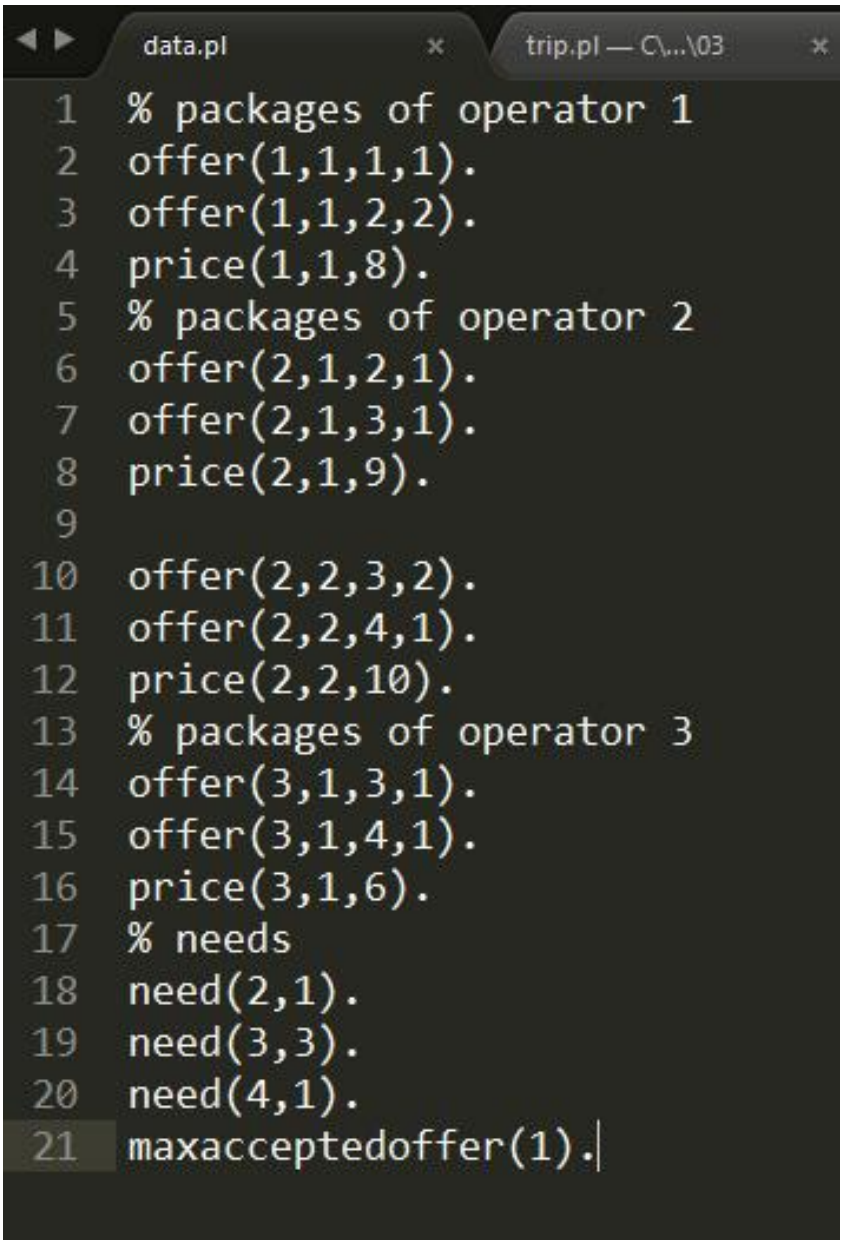
   (a) Use $findall(packages(O, P), offer(O, P, A, U), TotalPackagesWithD)$ to find all the packages in the problem and use compress() to remove the deplicate.

   (b) Use $findall(X, comb(TotalPackages, X), Listlist)$ to get all the combination of packages into one list called Listlist.

   (c) At the same time, not all the combination can be added into Listlist. I add two constraints along with $comb(TotalPackages, X)$ in (b).
   The first constraint is that the solution can meet max accepted offer, I need to add the number of packages of each operators can check whether is satisfy the max accepted offer. The second constraint is that the solution can meet the total need. I add up the need which each solution can satisfy and compare them to the need in the problem. Only these solutions which can satisfy the need can be added.

   (d) Finally, I calculate the cost of each legal solution. And get the minimum index of solution, then print the least cost and the solution.

3. **How the run the program**
   There are two steps to run the program. There are two .pl files which are data.pl and trip.pl. In the file called data.pl, it stores the facts like this.



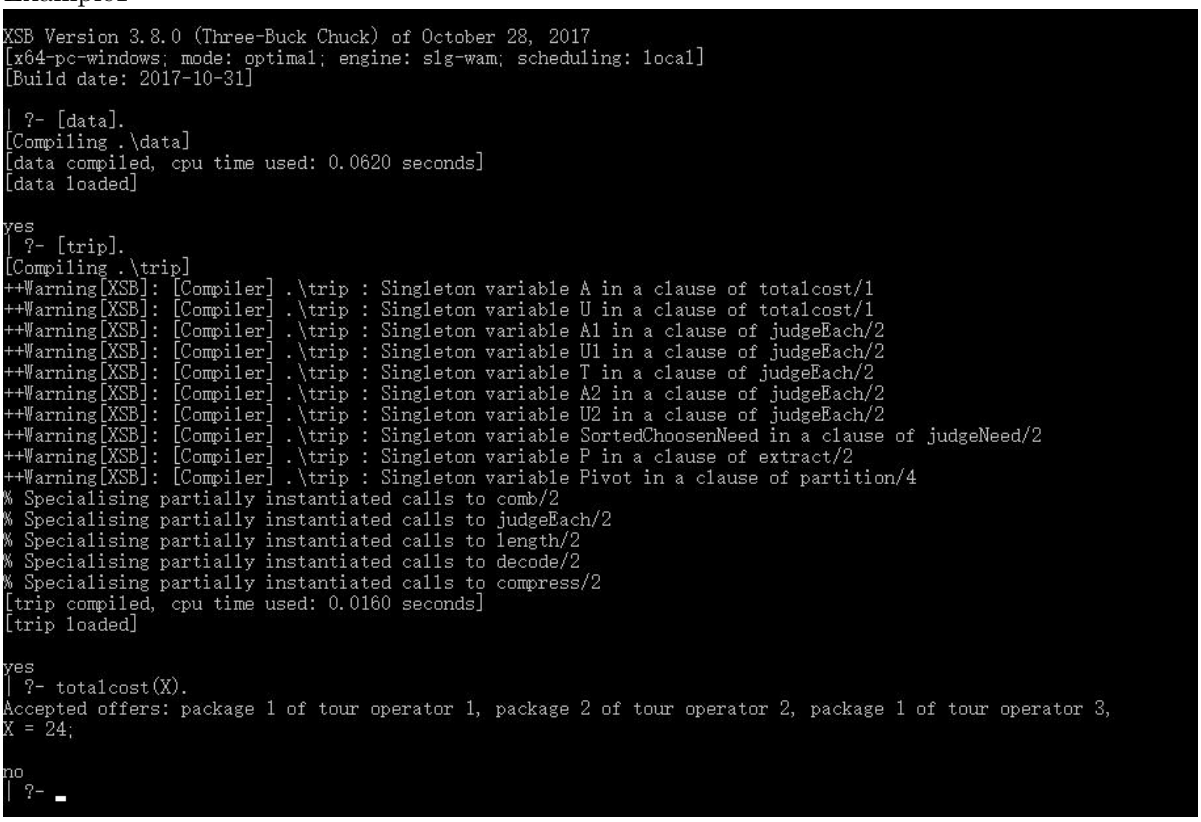
If we want to change the facts for different tests. We just need to change data.pl file.

The other file is trip.pl which store the main program of this project. We can run the program in the following order.
$|? - [data].$
$|? - [trip].$
$|? - totalcost(X).$

4. **Test**

   Test two examples on the website.

   Example1



   Example2