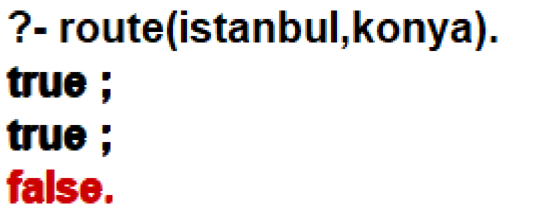
CSE341-Programming Languages

Homework #4

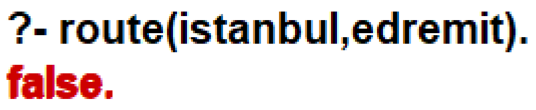
Part 1.

For this question, we are expected to answer the question whether there is any flight between the provinces.

First, we have determined the fact that the flights between the provinces. (e.g., flight(istanbul,izmir).) Then, the interconnected flights are checked from the starting point to the destination. Outputs "true" for each found path, outputs "false" if no more, or "false" if no path is found.



```
?- route(istanbul,konya).
true ;
true ;
false.
```

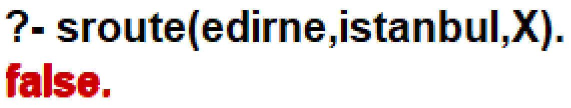


```
?- route(istanbul,edremit).
false.
```

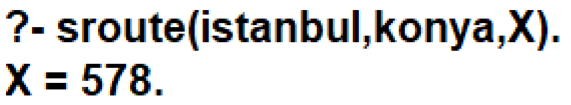
Part 2.

As a continuation of the first question in this question, we are asked to find the shortest flight between two given cities.

Accordingly, all roads from the starting city to the ending city are found and the shortest distance is selected. Returns "false" if a path is not found, otherwise returns the length of the shortest path.



```
?- sroute(edirne,istanbul,X).
false.
```



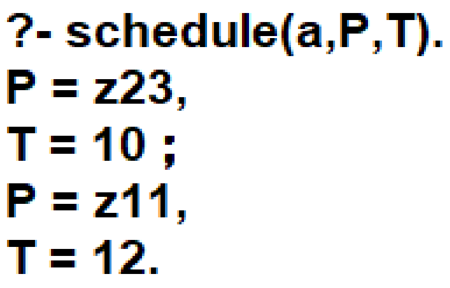
```
?- sroute(istanbul,konya,X).
X = 578.
```

Part 3.

First of all, the facts statements of the table given to us for this section are written.

3.1.

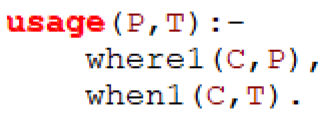
First, we find the course of the desired student. Then we find out where the course will be held. Finally, we'il figure out when.



```
?- schedule(a,P,T).
P = z23,
T = 10 ;
P = z11,
T = 12.
```

3.2

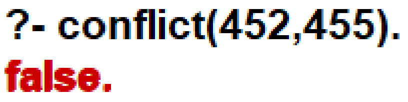
The desired room is used for which course is used, and then which hours will be used.



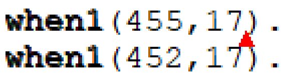
```
usage(P,T):-
    where1(C,P),
    when1(C,T).
```

3.3

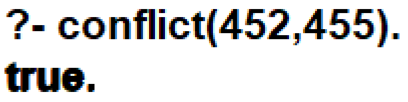
whether the room can be two courses at the same time. However, according to our table, it will always turn "false". But if we change it like this 455 17 207 or 452 16 207, it will return "right".



```
?- conflict(452,455).
false.
```



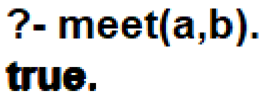
```
when1(455,17).
when1(452,17).
```



```
?- conflict(452,455).
true.
```

3.4

The students who took the same course met each other.

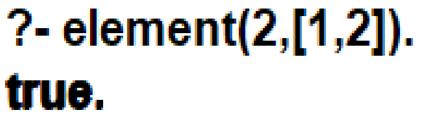


```
?- meet(a,b).
true.
```

Part 4.

4.1.

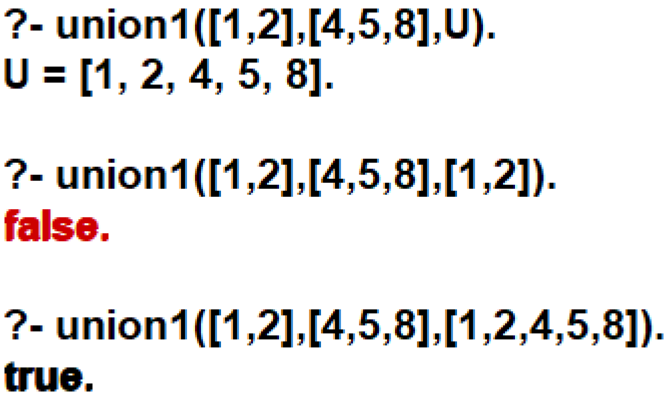
E is a natural number. S is a set. Returns true if E is in S.



```
?- element(2,[1,2]).
true.
```

4.2.

S1 and S2 and S3 are set. Returns true if S3 is the union of S1 and S2. In addition, returns the union of sets S1 and S2.



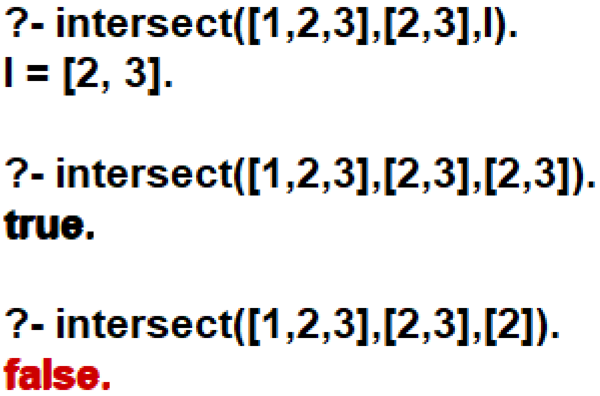
```
?- union1([1,2],[4,5,8],U).
U = [1, 2, 4, 5, 8].

?- union1([1,2],[4,5,8],[1,2]).
false.

?- union1([1,2],[4,5,8],[1,2,4,5,8]).
true.
```

4.3

S1 and S2 and S3 are set. Returns true if S3 is the intersection of of S1 and S2. In addition, returns the intersect of sets S1 and S2.



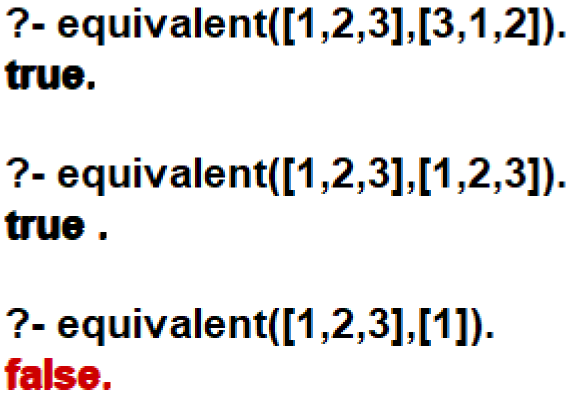
```
?- intersect([1,2,3],[2,3],I).
I = [2, 3].

?- intersect([1,2,3],[2,3],[2,3]).
true.

?- intersect([1,2,3],[2,3],[2]).
false.
```

4.4

S1 and S2 are set. Returns true if S1 and S2 are equivalent sets.



```
?- equivalent([1,2,3],[3,1,2]).
true.

?- equivalent([1,2,3],[1,2,3]).
true .

?- equivalent([1,2,3],[1]).
false.
```