CMPSCI4250 Project3 Question1

10/20/19

```
1
    male(pete).
2
    male(mark).
3
    male(john).
4
    male(frank).
5
    male(tom).
6
    male(matt).
7
    male(henry).
8
    male(todd).
9
10
    female(lilly).
    female(kate).
11
12
    female(anne).
13
    female(alice).
    female(jenny).
14
15
16
    parent(pete, mark).
    parent(pete, tom).
17
    parent(pete, anne).
18
19
    parent(mark, lilly).
    parent(mark, john).
20
21
    parent(mark, frank).
22
    parent(tom, kate).
23
    parent(anne, alice).
    parent(anne, matt).
24
25
    parent(alice, henry).
    parent(matt, jenny).
26
    parent(matt, todd).
27
28
    sister(Sis, Sibling) :- female(Sis), parent(Parent, Sis), parent(Parent, Sibling), Sis \= Siblir
29
30
    brother(Bro, Sibling) :- male(Bro), parent(Parent, Bro), parent(Parent, Sibling), Bro \= Sibling
31
32
    sibling(Sibling1, Sibling2) :- parent(Parent, Sibling1), parent(Parent, Sibling2), Sibling1 \= $
33
34
35
    father(Dad, Child) :- male(Dad), parent(Dad, Child).
36
    mother(Mom, Child) :- female(Mom), parent(Mom, Child).
37
38
    grandparent(GrandParent, Child) :- parent(Parent, Child), parent(GrandParent, Parent).
39
```

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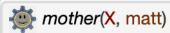




false



false



X = anne

false



true

CMPSCI4250 Project3 Question2

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```
1 | maximum_number([X], X).
2 | maximum_number([X|Y], X) :- maximum_number(Y, Z), X >= Z.
3 | maximum_number([X|Y], N) :- maximum_number(Y, N), N > X.
```

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```
trace, maximum_number([1, 2], X).
       Call: maximum_number([1, 2], _3998)
        Call: maximum_number([2], _4310)
        Exit: maximum_number([2], 2)
        Call: 1>=2
        Fail: 1>=2
      Redo: maximum_number([2], _4314)
        Call: maximum_number([], 4310)
         Fail: maximum_number([], _4310)
      Redo: maximum_number([2], _4314)
        Call: maximum_number([], _4310)
         Fail: maximum_number([], _4310)
        Fail: maximum_number([2], _4310)
     Redo: maximum_number([1, 2], _3998)
        Call: maximum_number([2], _3998)
        Exit: maximum_number([2], 2)
        Call: 2>1
        Exit: 2>1
       Exit: maximum_number([1, 2], 2)
X = 2
      Redo: maximum_number([2], _3998)
        Call: maximum_number([], _4730)
         Fail: maximum_number([], _4730)
      Redo: maximum_number([2], _3998)
        Call: maximum_number([], _3998)
         Fail: maximum_number(∏, _3998)
        Fail: maximum_number([2], _3998)
       Fail: maximum_number([1, 2], _3998)
false
```

maximum_number([-2, -1, 0, 1, 2, 3, 4.999, 5], X).

X = 5

false

CMPSCI4250 Project3 Question3

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```
1 | union_list([], X, X).
2 | union_list([X|Y], Z, W) :- member(X, Z), !, union_list(Y, Z, W).
3 | union_list([X|Y], Z, [X|W]) :- union_list(Y, Z, W).
```

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initial union_list([1, 2, 3], [4, 5, 6], X).

 $\mathbf{X} = [1, 2, 3, 4, 5, 6]$