

# Homework 10

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## 1. 给出一个集合，列出其所有元素

**Solution** 代码见下图(Figure1):

```
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| ?- [user].  
compiling user for byte code...  
member([A],[_|B]):-member([A],B).
```

Figure 1: member代码

以集合[1,2,3]为测试用例，结果如下图(Figure 2):

```
(3015 ms) yes  
| ?- member(X,[1,2,3]).  
  
X = 1 ? ;  
X = 2 ? ;  
X = 3  
  
yes  
| ?- |
```

Figure 2: member测试结果

## 2. 给出一个集合，列出其所有子集

**Solution** 代码见下图(Figure3):

```
[user].  
compiling user for byte code...  
subset([],[]).  
subset(A,[_|B]):-subset(A,B).  
subset([C|A],[C|B]):-subset(A,B).
```

Figure 3: subset代码

以集合[1,2,3]为测试用例，结果如下图(Figure 4):

```

| ?- subset(X,[1,2,3]).
X = [] ? ;
X = [3] ? ;
X = [2] ? ;
X = [2,3] ? ;
X = [1] ? ;
X = [1,3] ? ;
X = [1,2] ? ;
X = [1,2,3] ? ;

```

Figure 4: subset测试结果

### 3. 判断grandfather(X,yuqing)是否为真?

**Solution** 代码及测试结果见下图Figure5和Figure6, 由测试结果知, grandfather(X,yuqing)为真。

```

| ?- [user].
compiling user for byte code...
male(di).
male(jianbo).
female(xin).
female(yuan).
female(yuqing).
father(jianbo,di).
father(di,yuqing).
mother(xin,di).
mother(yuan,yuqing).
grandfather(X,Y):-father(X,Z),father(Z,Y).
grandmother(X,Y):-mother(X,Z),father(Z,Y).
daughter(X,Y):-father(X,Y),female(Y).

```

Figure 5: 题3代码(如题干)

```

| ?- grandfather(X,yuqing).
X = jianbo ?
yes

```

Figure 6: 题3测试结果