School of Data and Computer Science, Sun Yat-sen University

E11 Queries on KB

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1 Tips

bagof(+*Template*, :*Goal*, -*Bag*) *[ISO]*

Unify *Bag* with the alternatives of *Template*. If *Goal* has free variables besides the one sharing with *Template*, `bagof/3` will backtrack over the alternatives of these free variables, unifying *Bag* with the corresponding alternatives of *Template*. The construct +*Var*^*Goal* tells `bagof/3` not to bind *Var* in *Goal*. `bagof/3` fails if *Goal* has no solutions.

The example below illustrates `bagof/3` and the ^ operator. The variable bindings are printed together on one line to save paper.

```
2 ?- listing(foo).
foo(a, b, c).
foo(a, b, d).
foo(b, c, e).
foo(b, c, f).
foo(c, c, g).
true.

3 ?- bagof(C, foo(A, B, C), Cs).
A = a, B = b, C = G308, Cs = [c, d] ;  需点击分号（；）不断输出多个结果
A = b, B = c, C = G308, Cs = [e, f] ;
A = c, B = c, C = G308, Cs = [g].
一次性输出所有结果：bagof(C,foo(A,B,C),Cs),write(Cs),nl,fail.
4 ?- bagof(C, A^foo(A, B, C), Cs).
A = G324, B = b, C = G326, Cs = [c, d] ;
A = G324, B = c, C = G326, Cs = [e, f, g].

5 ?-
```

setof(+*Template*, +*Goal*, -*Set*) *[ISO]*

Equivalent to `bagof/3`, but sorts the result using `sort/2` to get a sorted list of alternatives without duplicates.

^/2 Existential quantification (`bagof/3`, `setof/3`)

2 Problem Description

Formulate each of the following questions as a query using Prolog's notation, pose it to Prolog, and obtain Prolog's answer:

1. What schools have campuses in Panyu District of Guangzhou?
2. What schools belong to both the University of 985 Project and Double First Class?

3. What schools only belong to the University of 211?

4. What schools were founded in the 30s and belong to the University of 211?

5. What schools have three campuses respectively in Guangzhou, Shenzhen and Zhuhai?

6. Which school has the longest history?

7. What schools have exactly two campuses?

Please define the new relations using Prolog and test them.

- sameDistrict(School1, School2): School1 and School2 have one or more campuses in the same district.

You should write down a listing that shows the queries you submitted to Prolog, and the answer returned. Hand in a file named E11_YourNumber.pdf, and send it to ai_2017@foxmail.com

3 Codes and Results