MSc Computing Science 2016-2017
Mock Prolog Laboratory Test

Imperial College London

Monday 12 December 2016

- Log into the Lexis exam system using your DoC login as both your login and as your password (**do not use your usual password)**.

- You are required to:
Submit an extension of the program in the file **mockAnswers.pl** according to the specifications, overleaf. You will find file **mockAnswers.pl** in your Lexis home directory (**/exam**). If you are missing this file please alert one of the invigilators.

- **Save your work regularly.**

- **Ensure that your predicates are spelled correctly. Copy and paste them from the provided file mockAnswers.pl.**

- The system will log you out automatically once the exam has finished. **It is therefore important that you save your work and quit your editor when you are told to stop writing.** No further action needs to be taken to submit your files – the final state of your Lexis home directory (**/exam**) will be your submission.

- No communication with any other student or with any other computer is permitted.

- Do not use any Prolog list processing or aggregation built-in functions, except, if required, *member*, *append*, *length*, *setof*, *findall*. Do not use cuts.

1. Some self-explanatory facts are given in the file **mockAnswers.pl**. Add the following definitions.

i) **ecb(M)**
to mean M is a mother who is entitled to child benefit. A mother is entitled to child benefit if she has a child who is 14 years old or younger, or if she is not employed and has a child who is older than 14 but not older than 16.

Example: the query ecb(X)
Should succeed with X = mary; X = rita ; X=tina; X = jane.
There may be repeated answers. That is acceptable and correct.

ii) **mother_of_the_youngest(M)**
to mean M is the mother of the youngest child. If there is more than one child with the same youngest age, then M should be the mother whose name comes alphabetically before the others.

Example: the query mother_of_the_youngest(M)
Should succeed with M=rita.

iii) **mothers_of_young(LM)**
to mean LM is the list of all mothers who have a child of 10 or younger. LM should be sorted and have no repetition. If there are no mothers with children of 10 or younger then the query mothers_of_young(LM) should fail.

Example: the query mothers_of_young(LM)
Should return LM = [mary, rita, tina].

2. Write programs for the following relations and add them to your file.

i) **merge(L1, L2, L)**
You can assume that in any call to *merge* the first two arguments (corresponding to L1 and L2) are sorted lists of integers. L should then be an ordered list resulting from merging the elements of L1 and L2.

Example: the query merge([1,3,5,5], [2,3,4,6], L)
Should return L=[1,2,3,3,4,5,5,6].

ii) **findElement(N, L, E)**
to mean E is the Nth element in list L. You can assume that in any call to *findElement* N and L are given. If N is less than 1 or is greater than the length of L then the query should fail.

Example: the query findElement(3, [1,3,5,5], E)
Should return E=5.