

COSC 4P79 Expert Systems Term Test
 Date: Wednesday November 18 2009
 Instructor: Brian Ross

NAME (print): _____

STUDENT NUMBER: _____

All questions are to be answered on the test paper. Use the backs of pages if necessary.
 Please keep written answers brief and to the point.
 No aids are permitted, other than a calculator without a memory bank, and a 3" by 5" index card with handwritten notes.
 Use or possession of unauthorized materials will automatically result in the award of a zero grade for this test.

Question	Total	Mark
1	20	
2	16	
3	12	
4	16	
5	16	
Total:	80	

Question 1 [20] Define and briefly discuss the following terms as used in the course:

a) paradox of expertise

b) knowledge engineer

c) frame

d) inductive inference

e) explanation

Question 2 [16]

Discuss the basic architecture of an expert system. Discuss the function and relevance of all the components. Include a diagram.

Question 3 [12]

Define forward chaining and backward chaining. Discuss their basic characteristics, as well as the kinds of problems each are best suited.

Question 4 [16]

Recall this rule from OOPS:

```
% f3 - the tv should be opposite the couch
rule f3:
  [1: furniture(tv,LenTV),
   2: position(couch, CW),
   3: opposite(CW, W),
   4: wall(W, LenW),
     LenW >= LenTV]
==>
  [retract(1),
   assert(position(tv, W)),
   retract(4),
   NewSpace = LenW - LenTV,
   assert(wall(W, NewSpace))].
```

(a) [4] Explain how the OOPS inference engine will decide when to select and fire this rule, from amongst the others in the KB.

(b) [4] What does this rule do when fired? Explain all the lines of code that will be executed, and why they are used.

Question 4 (cont)

(c) [4] How did the FOOPS (Frame OOPS) shell “clean up” this and other rules? What techniques were used to do that, and how?

(d) [4] Discuss the issue of explanation with the OOPS shell. How does it compare to the Native shell, and why?

Question 5 [16] Do **two** of the following.

(a) [8] What is the MYCIN model of uncertainty? Discuss some of its features. Also discuss what circumstances in which the MYCIN approach might be desirable over a normal backtracking strategy.

(b) [8] Define the terms "interview" and "case study" as they pertain to knowledge elicitation. Compare the relative strengths and weaknesses of performing interviews versus case studies.

(c) [8] Identify and discuss an example of using machine learning technology during knowledge engineering. Identify how such a technology helps with expert system development.

Question 5 (cont)

?- assert(Good Luck on the Project CF 100).