

Week beginning 13.10.85

*Artificial Intelligence 2
PROLOG TUTORIAL 1*

To be handed in to your Tutor at the end of your tutorial.

1. Here is one rule and four facts:

```
parent(A,B,C):-
  mother(A,B),
  father(A,C).
```

```
mother(john,ann).
mother(mary,ann).
```

```
father(mary,fred).
father(john,fred).
```

a) Give an interpretation of the predicate parent/3. Provide both a procedural and declarative reading.

b) Write down the AND/OR tree that results from executing the goal

```
parent(john,X,Y)
```

and determine what X and Y are bound to if the goal succeeds.

2. Redo the previous question with the goal

```
parent(mary,M,F),parent(john,M,F).
```

3. Given the set of facts and rules:

```
tall(bill).
tall(jim).
tall(janet).
```

```
parent(jane,tony).
parent(andy,bill).
parent(jane,janet).
parent(john,jim).
```

```
tall(X):-
  parent(X,Y),
  tall(Y).
```

a) Draw the AND/OR tree for the execution of the goal

```
tall(jane)
```

b) Discuss how Prolog solves/fails to solve this subgoal.

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4. Here is the predicate member/2. member(X,Y) is supposed to succeed as a goal if the first argument is an element of the second argument -which must be a list. Otherwise it should fail.

```
member(Element,[Element|Tail]).
```

```
member(Element,[_|Tail]):-
  member(Element,Tail).
```

a) Write out the AND/OR tree for the execution of the goal

```
member(a,[b,r,a,i,d])
```

b) Consider the goal

```
member(X,[b,r,a,i,d])
```

It succeeds with what binding of X? If the goal has to be REDOne what is bound to X on the next success?

Note to Tutors:

If you finish the set questions early you might investigate how they have been getting on with the exercises and project given out in class on 11th October. A copy is enclosed.