Knowledge Representation and Reasoning

Exercises on Well-Founded Semantics

1 Well-Founded Semantics

1. Determine the well-founded model of the following normal logic program:

```
a :- not b.     g :- not h.     d :- not e.
b :- not a.     h :- not g.     f :- d.
c :- not a.     i :- g.
c :- not c.     i :- h.
```

2. Determine the well-founded model of the following normal logic program.

```
winning(X) :- move(X,Y), loosing(Y).
loosing(X) :- not winning(X).
move(a,b).     move(b,d).     move(a,c).     move(c,c).
```

3. Consider the following taxonomic knowledge expressed by the sentences:

   - Normally, big carnivorous are dangerous.
   - Cats are an exception to the above rule.
   - Felines are carnivorous.
   - Both lions and cats are felines.
   - Lions are big.
   - Normally, tamed animals are not dangerous.
   - King is a tamed lion.
   - Tom is a big cat.

   (a) Represent the previous taxonomic knowledge using extended logic programming.

   (b) Compute the extended well-founded model and explain what you can conclude regarding Tom and King.