

Worksheet #2 April 23rd, 2020

Paper: Inference and learning in probabilistic logic programs using weighted boolean formulas

- General questions
 1. What is this paper about? Could you summarise its contribution in a paragraph?
 2. How does this work differ from others mentioned in the paper?
 3. Do the authors present experiments? What is the methodology used? Does it sound correct? Why?
 4. What are the main results/findings/conclusions? Are the results useful/relevant? Why?
- Technical questions
 1. What is the difference between “learning from interpretations” and “learning from entailment”? (It may be useful to consult this other paper
 2. Apply steps (1) to (3) shown in pages 367 through 368 to the basic ProbLog example below. What is the resulting formula? Also apply inference (page 375) to the given query using WMC (World Model Counting).

```
0.8::stress(ann).
0.4::stress(bob).
0.6::influences(ann,bob).
0.2::influences(bob,carl).

smokes(X) :- stress(X).
smokes(X) :- influences(Y,X), smokes(Y).

query(smokes(carl)).
```

3. Why the conversion of cyclic rules to a boolean formula is more complicated?
4. Can you use one of the algorithms mentioned in page 372 to the program below (mentioned in page 366)? Also apply inference (page 375) to the given query using WMC (World Model Counting).

```
0.6::edge(1,2).  
0.1::edge(1,3).  
0.4::edge(2,5).  
0.3::edge(2,6).  
0.3::edge(3,4).  
0.8::edge(4,5).  
0.2::edge(5,6).
```

```
path(X,Y) :- edge(X,Y).  
path(X,Y) :- edge(X,Z), path(Z,Y).
```

```
query(path(1,6)).
```

5. Using the example found here, explain the steps to learn the parameters of this program, according to Section 7 (page 381).