Philosophy 4310 –- Assignment #6

This assignment is to be turned in at the beginning of class on Thursday, May 4th.

Part I:

In "Most Counterfactuals are False", Alan Hájek describes a principle that he calls "The Poisoning Principle".

1. State what this principle is and carefully explain why it is equivalent to the following principle we might call SDA (Simplification of disjunctive antecedents):

SDA: $(A \vee B) > C \vdash A > C$

Hint: You may assume that if one proposition is logically equivalent to another, you can freely substitute it in a formula and the truth-value will be the same. For example, A∨B is equivalent to B∨A and so anything that is true with 'A∨B' in it will also be true if we replace 'A∨B' with 'B∨A'.

2. Prove whether SDA is valid or invalid in Lewis/Stalnaker semantics

3. Prove that SDA is equivalent to Antecedent Strengthening (prove both directions)

Hint: A is logically equivalent to (A&B) ∨ (A&~B)

Part II:

In "Probabilities of Counterfactuals and Counterfactual Probabilities", Alan Hájek argues against Dorothy Edgington's view that counterfactuals do not have truth conditions but do have probabilities. Edgington says that P(A > C) is the conditional probability of C on the supposition of A – or "your view about how likely it *was* that C *would have happened*, given that A had."

4. Hájek claims that it is not clear that these would be probabilities in the sense that they would satisfy the axioms of probability. In particular, he seems worried about the additivity axiom which says that if A and B are mutually exclusive, then P(A∨B) = P(A)+P(B). 'Mutually exclusive' just means that ~(A&B) is a tautology. But a related worry of Hájek's is that it is not even clear what connectives like negation mean if the counterfactuals aren't true or false in the first place. Adams and Bennett deal with this in the indicative case by simply saying that we can define the P(~(A → C)) as P(A→ ~C). This fits with 'The Equation' since 1-P(C|A) = P(~C|A). Will a similar maneuver work for counterfactuals here? Can we just define P~(A > C) as P(A > ~C)? The answer is that it depends on whether we accept Conditional Excluded Middle. Explain why. HINT: All and only theorems of the true counterfactual logic should have probability 1.

(two pages)

Part III:

David Lewis starts his paper "Causation" by talking about a regularity account of causation. By the 'regularity account', I mean the analysis that Lewis gives on page 556. There are some famously difficult problems for such accounts.

5. Imagine that the atmospheric pressure drops (P) and then the barometer reading drops (B) and then a storm arrives (S). Explain what the regularity account would say about whether P causes B, whether P causes S, and whether B causes S. How does Lewis's account handle this case?

6. Imagine that Adam and Barbara are both in a room and both are determined to push a button on the other side of the room. Adam has a head start and pushes the button leading to a chain reaction and an explosion. Barbara was right behind him the whole time and would have pushed the button if Adam didn't. Explain what the regularity account says about whether Adam being in the room is a cause of the explosion and about whether Barbara being in the room is a cause of the explosion. What does Lewis's account say about this case?