Write a 5 to 7 page paper exploring a topic relating to modal logic. Some examples.

(1) Anselm tried to prove God's existence from two premises: God by definition must possess every perfection, and existence is a perfection—it is more perfect to exist than not to. This is called the ontological argument. Charles Hartshorne in the 20th century attempted a modernized modal version of the argument. (*G* says that God exists.)

- 1. $G \equiv \Box G$ (by definition of God)
- 2. $\diamond G$ (the hypothesis of God's existence is not *incoherent*)
- 4. $\diamond \Box G \equiv \Box G (S5(3))$
- 5. □*G* (3,4 x MP)
- 6. G (5, T)

Hartshorne's version of the argument is a bit different. How? What if anything is wrong with the argument in either version?

(2) What is essentialism? What are some examples of essentialist hypotheses? What are some of Quine's objections to essentialism? Are they convincing?

(3) Hesperus and Phosphorus only happen to be identical, it seems. They could have turned out to be distinct. Yet if they are identical at all, they must (by Leibniz's Law) have all their properties in common. Hesperus has the property of being necessarily identical to Hesperus, so Phosphorus has that property too. But then they are not contingently identical after all! What should we say about this argument? Is the identity contingent, or not?

(4) Compare and contrast Ruth Barcan Marcus's proof of the necessity of identity with Kripke's proof.

(5) Anything you like, with permission of the instructor.

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