Intensionality:

Tense: Louise was in love with Thelma

Possibility: It is possible that I am married to a millionaire

It is possible to marry a millionaire

Counterfactuals: If Gore had beat Bush in 2000, there would be no war in Iraq.

Psychological verbs: Sammy believes that Santa delivers presents

George is looking for the Fountain of Youth

George wants Paul Martin to resign

Possible Worlds:

“what would be the case if some events had been different than they in fact were”

“different ways that things might have been”

“a complete (and consistent) listing of all potential facts”

“a maximal consistent set of sentences/propositions”

Tense:

One could view tense as just a series of possible worlds, each connected to the next by being “the next instant in time”.

But it is more common (and linguistically useful) to try to do both “regular” possible worlds and “time-related” possible worlds independently of one another.

In this way we can talk about “how things might have been yesterday if the Dean had acted on my request the day before” and the like.

So….

Given: m = Mary, s = Sam, B^1: *x* is a bear. What do these say?

a. $\Box\exists x\, B^1(x)$

b. $\exists x\, \Box\, B^1(x)$

c. $\forall x\, [B^1(x) \rightarrow \mathbf{F}\, B^1(x)]$

d. $\mathbf{F}\, \mathbf{P}\, \forall x\, B^1(x)$

e. $\mathbf{P}\, B^1(x) \wedge B^1(x) \wedge \mathbf{F}\, B^1(x)$

f. $\Diamond\Box\forall x\, B^1(x)$

g. $\neg\, \mathbf{P}\, B^1(j)$

h. $\mathbf{P}\, \neg\, B^1(j)$

i. $\forall x\, B^1\, \Box(x)$

j. $\neg\, B^1\mathbf{F}(j)$

Practice: Translate these into IPC formulas

a. Woods may win the Tournament of Champions.
b. Perhaps everybody saw a movie.
c. Perhaps there is a movie that everybody saw.
d. Necessarily there is a number that is greater than 7.
e. There is a number which is necessarily greater than 7.
f. When John entered the room, Mary had closed the window.