PROBLEM SET 5
due by Thursday, March 21 in class

PHILOSOPHY OF LANGUAGE

Exercise 1 (24 pts.) Let w_1 be the actual world, w_2 be a world just like the actual world but where every actual politician (incl. Obama, Clinton, Trump) instead became a pop singer, and every actual pop singer (incl. Ariana Grande) instead became a politician. Let w_3 be a world just like w_1, except where everyone who loves someone in w_1 is loved back by them in w_3 (all love in w_3 is requited love).

Say whether the following claims are true or false (or would reasonably be taken to be true or false on a semantics for English like the ones we have been giving.)

(a) $[\![\text{Barack Obama}]\!]^{w_1}$ is a function.

(b) $[\![\text{Donald Trump is a pop singer}]\!]^{w_2}$ is a truth value, namely *true*.

(c) $[\![\text{Hilary Clinton's rap single was a billboard 100 hit}]\!]^{w_1}$ is an intension.

(d) for any a, if a loves Ariana Grande in the actual world, then $\langle \text{Ariana Grande}, a\rangle \in [\![\text{loves}]\!]^{w_3}$.

(e) for any a, if $a \in [\![\text{is a politician}]\!]^{w_1}$ then also $a \in [\![\text{is a pop star}]\!]^{w_2}$.

(f) $[\![\text{is a pop singer}]\!]^{x} = [\![\text{is a politician}]\!]^{x}$

(g) $[\![\text{is a pop singer}]\!]^{w_2} = \{y : y \text{ is a politician in } w_1\}$

(h) $[\![\text{loves}]\!]^{w_3} = \{\langle y, z\rangle : z \text{ loves } y \text{ in } w_1\}$ (pay attention to the order of the variables!)

Exercise 2 (12 pts.)

Consider the language $\mathcal{L}$ given by the following lexicon and interpretation.

Lexicon & Interpretation of $\mathcal{L}$

Cat.	Lexical Item	Semantic Value of Lexical Item		
N	Ivan	$[\![\text{Ivan}]\!]^x$	=	Ivan
	Marissa	$[\![\text{Marissa}]\!]^x$	=	Marissa
V_I	sings	$[\![\text{sings}]\!]^x$	=	$\{a : a \text{ sings in } x\}$
	dances	$[\![\text{dances}]\!]^x$	=	$\{a : a \text{ dances in } x\}$
V_T	framed	$[\![\text{framed}]\!]^x$	=	$\{\langle a, b\rangle : a \text{ framed } b \text{ in } x\}$

Suppose the syntactic and semantic rules for this language are just those we gave on **pages 1-4** of handout 14.

Consider the following sentence

(1) Ivan framed Marissa.

Do the following:

(a) Give a tree, like the ones we made in class, to show the syntactic structure of this sentence.

(b) Show how from the semantic values given to the lexical items and the semantic rules of composition we can derive a semantic value for the whole sentence. Show all your work!

Exercise 3 (14 pts.)

Suppose we have a language given by the the lexicon and interpretation in the previous question, but with the addition of a new word: "and" of category Conj. (conjunction). Suppose the semantic value of "and" is specified as follows:

$$[\![\text{and}]\!]^x = \text{INTER}$$

INTER is a function on two intensions (in this case, functions from worlds to sets) given as follows: if A^x is such an intension and B^x is such an intension, $\text{INTER}(A^x, B^x) = \{a : a \in A \text{ in } x \text{ and } a \in B \text{ in } x\}$

Suppose the syntactic and semantic rules are those given on **pages 1-4** of handout 14 but with the following changes and additions:

Syntactic Rule 2: A verb phrase VP can be made up of either

- an intransitive verb V_I, or
- a transitive verb V_T and a noun N, or
- an intransitive verb V_I followed by a conjunction Conj., followed by another intransitive verb V'_I.

Semantic Rule 3: If a verb phrase VP branches into an intransitive verb V_I followed by a conjunction Conj. followed by another intransitive verb V'_I. Then $[\![\text{VP}]\!]^x =$

$$[\![\text{Conj.}]\!]^x([\![\text{V}_\text{I}]\!]^x, [\![\text{V}'_\text{I}]\!]^x)$$

For sentence (2) below, do (a) and (b).

(2) Marissa sings and dances.

(a) Give a tree, like the ones we made in class, to show the syntactic structure of this sentence. (Note: this will involve a node that branches into *three*, which we have not yet seen.)

(b) Show how from the semantic values applied to the lexical items of the sentence and the semantic rules of composition we can derive a semantic value for the whole sentence. And again, show all your work!