Final, Extended Problem Set on the PTQ System

1. Exercises Concerning the English Fragment

(1) **Exercise on the Syntactic Rules of the Fragment**
Please provide derivations showing that each of the following are meaningful expressions of the English fragment in PTQ.

a. **a woman hasn't eaten the unicorn such that she has found it**

b. **John will talk about every woman**

c. **Bill doesn't believe that every man or every woman dates him voluntarily**

(2) **Question Concerning Relative Clauses and Adverbs**
An English sentence can contain an unbounded number of relative clauses and adverbs. Does the English fragment in PTQ accurately capture this property of English? Why or why not?

(3) **Question Concerning Conjoined IVs**
Does the English fragment in PTQ accurately predict that (3a) and (3b) are both meaningful expressions of English, while (3c) is not? Why or why not?

a. **John wishes to walk and talk**

b. **John walks and talks**

c. *** John wishes to walks and talk**

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2. Exercises Concerning Intensional Logic

In the exercises below, we will assume the following meta-language abbreviations and labels for the variables and constants of IL.

Type	Variables	Constants
e	x, y, z	*j, b, m*
<s,e>	r	----
<e,t>	X	**run', man'**
<<s,e>,t>	Q	**change'**
<s, <e,t>>	P	----
<e,e>	----	**father-of'**
<e,<e,t>>	R	**love'**
<s,t>	p	----
<<s,t>,<e,t>>	----	**believe'**

(4) **Exercise on the Syntax of IL**
For each of the formulae below, please state whether it is or is not a meaningful expression of IL. If it is a meaningful expression, please state its type. If it is not a meaningful expression, briefly explain why.

a.	$\hat{}j$	f.	$\lambda P\ P = \hat{}$**run'**
b.	**change'**($\hat{}j$)	g.	$[\hat{}^{\vee}X](\ ^{\vee}\hat{}j)$
c.	**run'**($\hat{}j$)	h.	$\hat{}\lambda x$ **love'**(j)(x)
d.	λr **change'**(r)	i.	$\lambda p\ \Box p$
e.	$\lambda P\{j\}$	j.	λy **father-of'**(**father-of'**(y))

(5) **Exercise on the Semantics of IL**
Let $\mathcal{M}$ be any intensional model <A, I, J, ≤, F> for IL, let i ∈ I and j ∈ J, and let g be an $\mathcal{M}$-assignment. Prove each of the following: [1]

a. $[[\ \neg W$ **run'**(j) $]]^{M,i,j,g} = 1$ *iff*
There is no j' ∈ J such that j < j' and F(**run'**)(<i,j'>)(F(j)(<i,j'>)) = 1

b. $[[\ [\lambda P\ P\{b\}](\hat{}$**love'**($m$)) $]]^{M,i,j,g} = 1$ *iff*
F(**love'**)(<i,j>)(F(m)(<i,j>))(F(b)(<i,j>)) = 1

c. $[[\ Vx\ [$**man'**(x) ∧ H **run'**(x)] $]]^{M,i,j,g} = 1$ *iff*
there is an $x \in D_{e,\,A,I,J}$ such that F(**man'**)(<i,j>)(x) = 1 and
for some j' ∈ J such that j' < j, F(**run'**)(<i,j'>)(x) = 1

d. $[[$ **believe'**($\hat{}$**run'**(j))(b) $]]^{M,i,j,g} = 1$ *iff*
F(**believe'**)(<i,j>)
(the function h with domain I×J such that if <i',j'> ∈ I×J, then
h(<i',j'>) = F(**run'**)(<i',j'>)(F(j)(<i',j'>)))
(F(b)(<i,j>)) = 1

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3. Exercises Concerning the Translation System

(6) **Exercise on the Analysis of Conjunction and Disjunction**
Does the system in PTQ predict that (6a) and (6b) will ever receive logically equivalent translations? Is this prediction accurate? [For the purposes of this exercise, please ignore 'quantifying in'.]

a. **a man or a woman walks and talks.**
b. **a man or a woman walks and a man or a woman talks**

[1] Note that for the purposes of this assignment, it is perfectly legitimate to show that a given formula of IL is logically equivalent to another, syntactically simpler one, and then calculate the extension of the simpler formula.

(7) **Exercise on the Analysis of De Re / De Dicto Ambiguity**
Show that the PTQ system predicts that (7a) should have a reading where it is true in scenario (7b). Is this prediction accurate?

a. The Sentence: **John believes that a man or a woman runs.**

b. The Scenario:
John sincerely asserts "a man or the world's best tennis player runs." Little does John know that the world's best tennis player is actually a woman.

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4. Thought Questions Concerning the MG Architecture

(8) **Trees as Grammatical Objects**
Please consider carefully the statement below. In what ways is it accurate, and in what ways is it an (over)simplification? Please defend your answer.

> "In Montague Grammar (MG), unlike in transformational frameworks like the Minimalist Program, trees are never grammatical objects. That is, in MG, the syntactic operations act on strings to create strings. Trees in MG are simply diagrams that the analyst uses as an expository devise, to compactly represent the derivations of the meaningful expressions, which are always strings."

(9) **Truth-Conditions and Model-Theoretic Semantics**
In LING 610, we learned of the importance of *truth-conditions* to semantic theory, and that semanticists seek to build systems that pair sentences of a natural language (e.g.) English with their truth-conditions.

Do the algebraic and model-theoretic semantic systems we learned about in this class – those in UG and PTQ – do this? That is, do they do they make predictions regarding the *truth-conditions* of English sentences? Why or why not?