Exercises for Atomic Sentences Without Functions or Identity

January 8, 2009

Due in class: January 13, 2008

Exercise 1a

Create a transcription guide for the following sentences.

a) Barack Obama was born in Hawaii.
b) Hawaii is smaller than Alabama.
c) If Illinois is larger than Alabama, and Alabama is larger than Hawaii, then Illinois is larger than Hawaii.
d) Barack Obama has lived in both Hawaii and Illinois.
e) Barack Obama has not lived in Alabama.
f) Although Barack Obama has lived in Illinois, he is not presently living there.

Exercise 1b

Transcribe the above sentences into predicate logic, using the transcription guide you have created.

Exercise 2

Which of the following are sentences of predicate logic?

a) Laaaaaaa
b) Ca∼b
c) DaaF
d) FFab
e) Gdgd

Exercise 3

Using the following transcription guide and your general knowledge, determine the truth-values of the sentences following.

o: one
t: two
f: four
Gxy: x is greater than y
Pxyz: x is the product of y and z
Sxyz: x is the sum of y and z

a) Gft
b) Pftt
c) Sfto
d) Goo
e) Poo

Exercise 4

Determine which of the underlined expressions is used, and which ones are mentioned.

a) The symbol '$\underline{\perp}$' is intended to represent a sentence that cannot be true.
b) If $\mathbf{X}$ is a sentence of predicate logic, then $\underline{\sim\mathbf{X}}$ is a sentence of predicate logic.
c) The sentence 'Barak Obama lives in Washington, D.C.' is <u>true</u>.

Exercise 5

Determine which of the following is a semantic fact, and which is a syntactic fact.

a) If $\mathbf{X}$ and $\mathbf{Y}$ are sentences of predicate logic, then $\mathbf{X} \vee \mathbf{Y}$ is a sentence of predicate logic.
b) The sentence '$\perp$' always has the truth-value false.
c) A sentence of the form $\mathbf{X} \supset \mathbf{Y}$ can be derived by assuming $\mathbf{X}$ and deriving $\mathbf{Y}$ from it.
d) In order to interpret the sentence 'Lab,' the names 'a' and 'b' must be assigned to members of the domain.