

PROBLEM SET 01

YOUR NAME

- (1) (This problem was inspired by my recent experience with the Baltimore Parking Authority in the difficulty in obtaining a parking pass, which made me realize the high demand and low supply for these. That is, Federal Hill parking passes are like gold.)

In English, what is the logical consequence of the following set of statements?

- A = “Marc leaves something valuable on display in his car.”
- B = “Marc’s car is parked in Federal Hill.”
- C = “Marc’s car gets broken into.”
- D = “Parking passes are valuable.”
- E = “Marc gets a \$77 parking ticket.”
- F = “Marc’s car has a parking pass on display in his car.”
- G = “Marc has to pay \$77 to fix his broken car window.”
- $A \wedge B \implies C$
- $B \wedge \sim F \implies E$
- $C \implies G$
- $D \wedge B$

- (2) (This problem was inspired by graffiti I read on a bathroom stall several years ago, which made an analogy between Clint Eastwood and the stall’s toilet paper.)

Translate the following sentences *taken literally* into quantified logic

where $Problem(x, p, y)$ means x has problem p with y .

(a) “Bob has problems with everybody.”

Here’s what this one should be: $\forall y \exists p \text{Problem}(Bob, p, y)$

(b) “Bob has no problems with everybody.” (In the sense that Bob doesn’t have problems with anybody.)

(c) “Bob has problems with nobody.”

(d) “Bob has no problems with nobody.”

(e) “Bob doesn’t have no problems with nobody.”

(3) Write the previous answer (which should have been $\sim \forall y \exists p \text{Problem}(Bob, p, y)$) such that the negations appear only within predicates (i.e., no negation appears in front of a quantifier).

(4) BONUS: rewrite “Clint Eastwood is rough, he’s tough, and he don’t take no crud off nobody.” taken literally in as simplified English as possible (i.e. using at most one negative).