

COMPUTER SCIENCE 20, SPRING 2012  
DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

Class #11 (Review of Quantificational Logic)

**Homework, due in hard copy Wednesday 2/22/2012 at 10:10am**

**This is an optional homework. If turned in, your score for HW#8 will be the higher of your original score and your score on this homework.**

**Please write your TF's name on your homework, and list the names of any students with whom you collaborated.**

1. Let the universe be the set of people. Define the predicates  $O(x, y)$  to be “ $x$  is older than  $y$ ,”  $A(x)$  to be “ $x$  is an adult,” and  $B(x)$  to be “ $x$  is a baby.” Translate the following (nonsensical) sentences into logical expressions.
  - (a) There is an oldest person.
  - (b) Everybody is older than someone.
  - (c) No one is older than himself.
  - (d) All adults are older than all babies.
  - (e) Either everyone is an adult or everyone is a baby.
  - (f) Everyone is either an adult or a baby.
  
2. Again let the universe be the set of people. Using the constants  $b$  for “my baby” and  $m$  for “me,” and the predicate  $L(x, y)$  for “ $x$  loves  $y$ ” translate the sentence “Everybody loves my baby but my baby only loves me” into logical expressions.