# CSE112 Introduction to Artificial Intelligence, Week 12 2019

**Predicate Logic Exercises**

**Question 1.** Translate the following into symbolic form:

1. Everybody likes him
2. Somebody cried out for help and called the police
3. Nobody can ignore her

**Question 2.** What do the following fomulas say about numbers?

1) xy (x < y  z(x < z  z < y)) 2) xy (y·y = x)

Give for each formula a set of numbers for which the formula holds and a set of numbers for which

the formula does not hold.

**Question 3**. State whether each of the following statements is true or false.

1. “Men and women are welcome to apply” is equivalent to

Question (2) – (5): say Attract is a relation from x to y, i.e., A(x,y) says x attracts y.

1. “Everything attracts something”, where “something” means “something or other”, is equivalent to “ x y A(x,y)”.
2. “Something is attracted by everything”, where “something” means “something in particular”, is equivalent to “x y A(x,y)”.
3. “Everything is attracted by something”, where “something” means “something or other”, is equivalent to “x y A(x,y)”.
4. “Something attract everything”, where “something” means “something in particular”, is equivalent to “x y A(x,y)”.

# Question 4. Some General Questions

Answer briefly. Please use your own words, and cite appropriately.

1. Represent the following sentences in first order logic:
   1. All dogs are mortal.
   2. No person buys an expensive policy
2. Translate the following axioms into predicate calculus
3. Mary is a lawyer
4. Ann is a computer scientist
5. Ann is rich
6. Lawyers are rich
7. Computer scientists are smart
8. Lawyers have nice cars
9. Smart, rich people have nice cars
10. A sentence is ( valid or satisfiable) if it is true in all models. (4).  entails  if and only if is unsatisfiable.

**Question 5** Questions on First-Order Logic

(a) Translate the following first-order sentences into English:





