Josh Johnson – Working Alone

CSE 415

Due: 4/13/2016

Assignment 2

Exercise 3

For each of the following, determine which of the two relations “subset of” or “element-of” is being represented, and reformulate the statement to make this clearer. The first one is done for you. If you find genuine ambiguity in a statement, justify each of the possible interpretations.

(a) Fido is a dog. Fido $\in$ dogs .

(b) A parrot is a bird.

Parrot $\subset$ birds.

(c) Polly is a parrot.

Polly $\in$ parrot.

(d) David Jones is a Jones.

David Jones $\in$ Jones.

(e) “George Washington” is a great name.

“George Washington” $\in$ great names.

(f) Artificial intelligence is a state of mind.

Artificial intelligence $\subset$ state of mind.

Exercise 4

For each of the following relations, state whether or not it is reflexive, whether or not it is symmetric, whether or not it is transitive, whether or not it is antisymmetric, and whether or not it is a partial order. For each example, let the set S on which the relation is defined be the set of elements mentioned in that example.

(a) {(a, a)}

Reflexive: True

Symmetric: True

Transitive: True

Antisymmetric: True

Partial order: True

(b) {(a, b), (a, c), (b, c)}

Reflexive: False

Symmetric: False

Transitive: False

Antisymmetric: True

Partial order: False

(c) {(a, a), (a, b), (b, b), (b, c), (a, c), (c, c)}

Reflexive: True

Symmetric: False

Transitive: True

Antisymmetric: True

Partial order: True

(d) {(a, b), (b, c)}

Reflexive: False

Symmetric: False

Transitive: False

Antisymmetric: True

Partial order: False

(e) {}

Reflexive: True

Symmetric: True

Transitive: True

Antisymmetric: True

Partial order: True