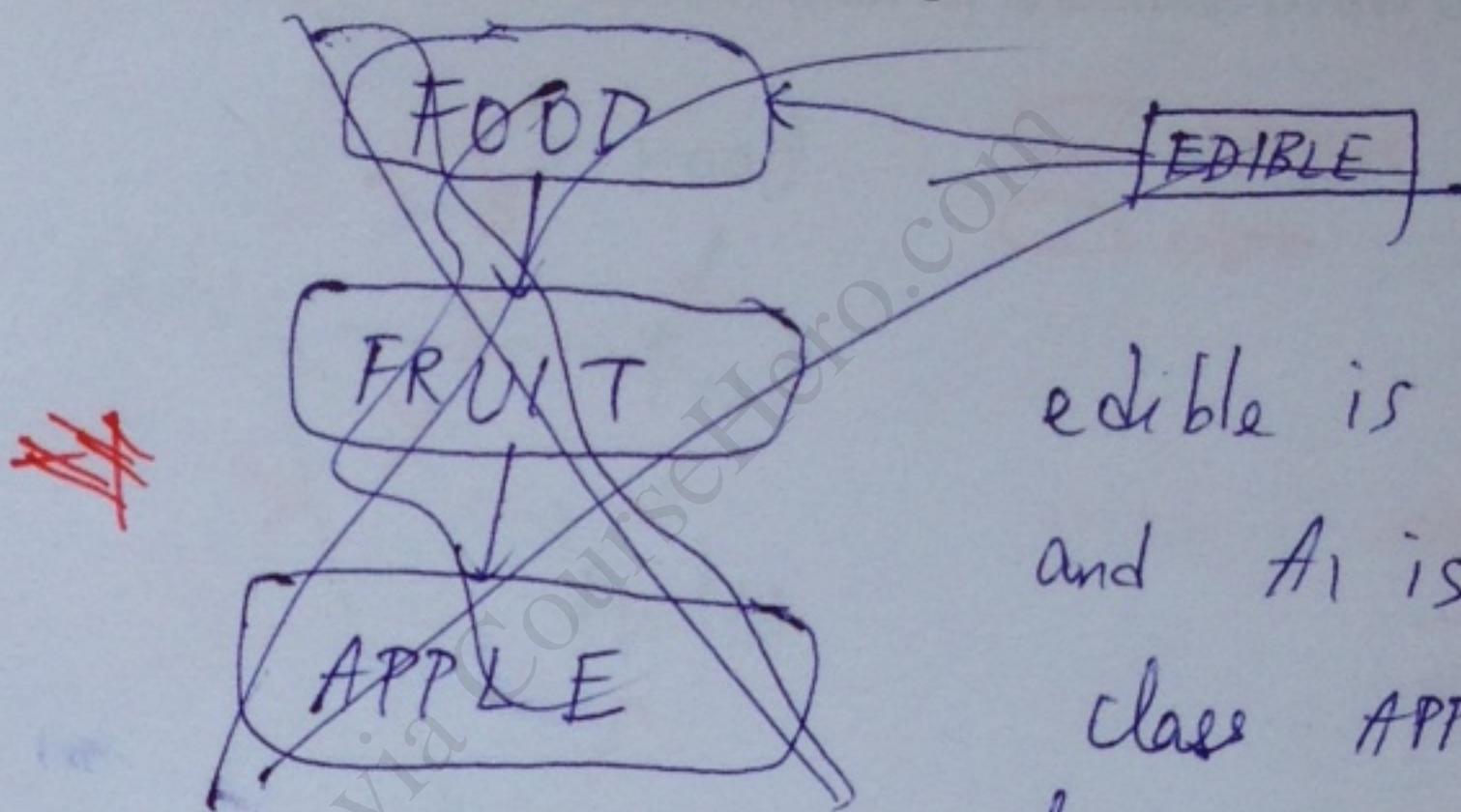
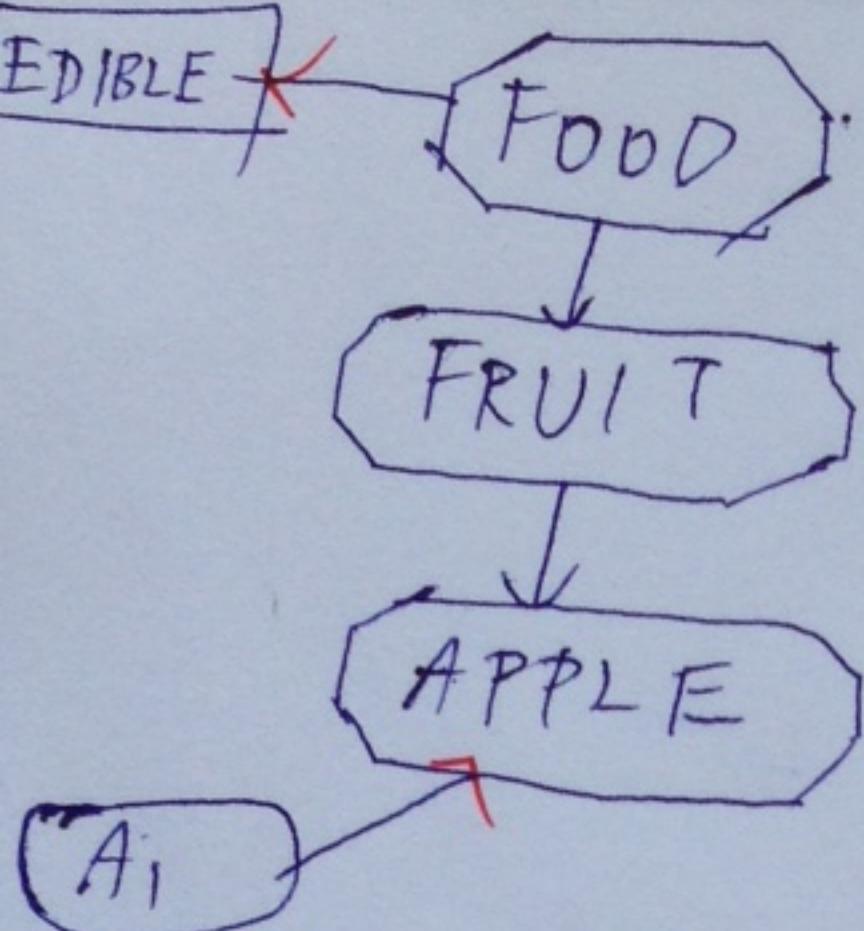


Name:
Student
Student

- 1) (5pts) Given if object A_1 is an element of the class Apples, Apples is a subclass of Fruit, Fruit is a subclass of Food, and all Food is edible, then A_1 is edible. Draw the hierarchy graph or ontology.



edible is a property of food
and A_1 is an object of
class APPLE. Since Apple
is a subclass of food, A_1 is edible, due to
inheritance

- 2) (5pts) Given the following FOL sentences:

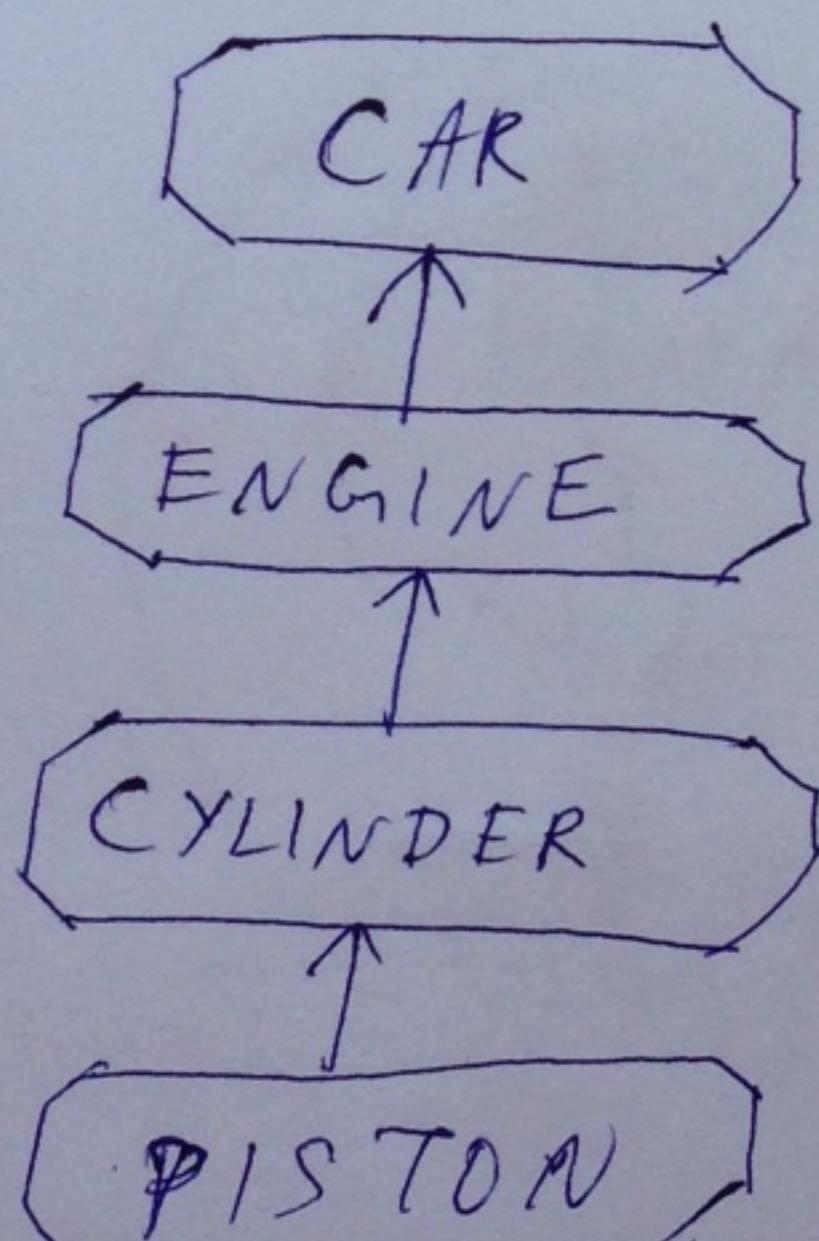
$\text{PartOf}(\text{Piston}_1, \text{Cylinder}_1)$

$\text{PartOf}(\text{Cylinder}_1, \text{Engine}_1)$

$\text{PartOf}(\text{Engine}_1, \text{Car}_1)$

$\forall x, y, z \text{ PartOf}(x, y) \wedge \text{PartOf}(y, z) \Rightarrow \text{PartOf}(x, z)$

Draw PartOf hierarchy graph:



From the graph, we can
infer that piston is part of
the car, due to "has a"
relationship.

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Wednesday, October 23, 2013
CS561 Artificial Intelligence
Quiz 7

12

- 1) (2pts) What is the Frame Problem? Give example from the wumpus world.

Things that ~~do~~ do not change in the problem.

✓

e.g. ~~Hold(G1), Agent(A1)~~.

The gold moves with the agent if the agent is holding the gold.

The gold will not move ^{its position} unless it is held by the agent.

- 2) (2pts) What is the Ramification Problem? Give example from the wumpus world.

The problem has ~~an~~ implicit effect.

✓

e.g. When the agent ~~is~~ is holding the gold, if the agent moves,
the gold moves with the agent.

- 3) (2pts) What is a fluent? Give example from the wumpus world.

The function or predicate that ~~its~~ its truth value can be changed at
different time.

✓

e.g. At(agent, X). X is a location.

- 4) (2pts) What is an atemporal predicate? Give example from the wumpus world.

The predicate that does not change during times.

✓

e.g. Hold(G1)

- 5) (2pts) What is situation calculus? Give example from the wumpus world.

The situations ~~represented in~~ generated by actions and can be used in problem
solving and planning.

✓

e.g. ~~situation s~~ Agent moves from x to y, grab the gold

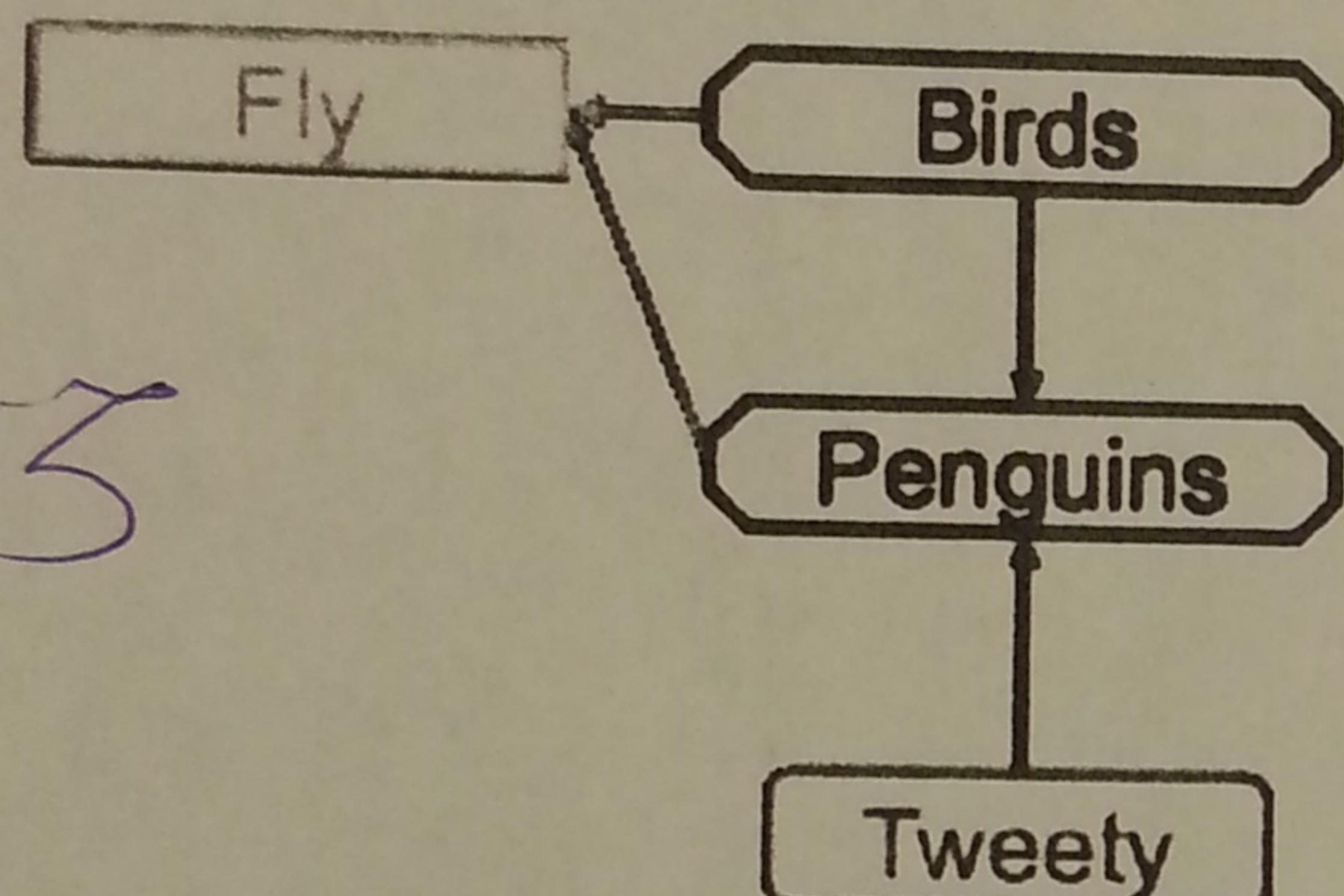
$S_1 = \text{RESULT}(\text{Go}(x, y), S_0)$.

$S_2 = \text{RESULT}(\text{Grab(gold)}, S_1)$

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Thursday, October 24, 2013
 CS561 Artificial Intelligence
 Quiz 7

- 1) (5 pts) Given this ontology with multiple inheritance, we can infer that birds can (generally) fly, but penguins can't. Since Tweety is a penguin, can Tweety fly? How can we infer whether Tweety can fly from the ontology?



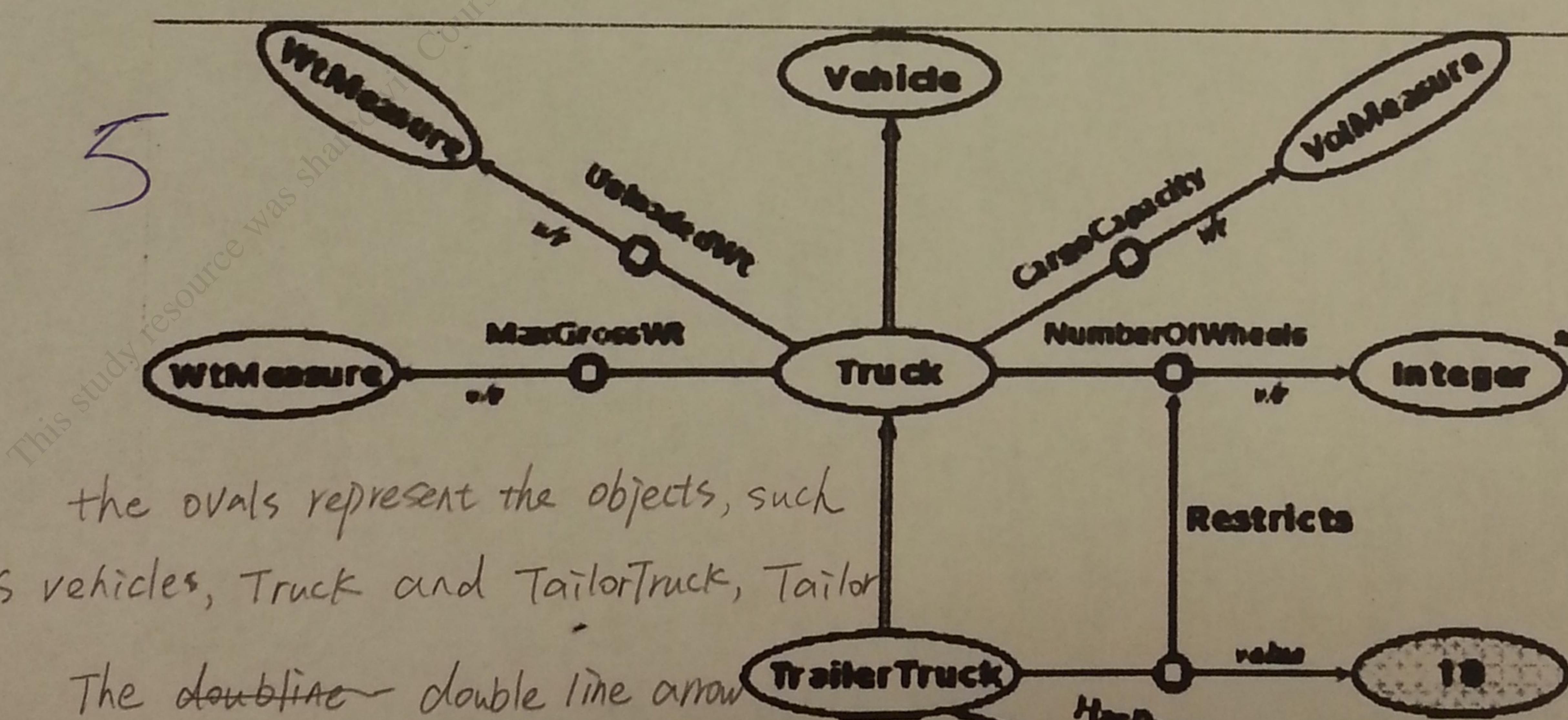
3

No, Tweety can't fly.

~~Since there are no~~

For this situation, the inference would override the default ~~say~~ which says birds can fly. Instead, since penguins is much closer in level to Tweety, the inference would inherit Penguins' attribute — not fly, thus overriding the default, resulting in Tweety not fly.

- 2) (5 pts) Given this semantic network, what type of knowledge do the ovals represent and what type of relationships between the ovals are represented by the arrows.



5
 This study resource was shared
 the ovals represent the objects, such
 as vehicles, Truck and TailorTruck, Tailor

The double-headed arrow represents the inheritance (subclass) relation.

The single line arrow represents the attributes of objects. Also, the single line arrow can also restrict the value of an attribute, just like specifying the number of wheels of TailorTruck to 18.