Is A vs. Has A

Corresponding Material
Classes and Object-Oriented Programming

Discussion
Large programs are often built using multiple classes. For example, a Program might have 3 different classes, a Person class, a Student class, and a Worker class. Within this program, we may see several different relationships.

Person

Name
Birthday

Student

Grade
School

Worker

Job Title
Salary

HAS A relationships:

A Person **HAS A** Name.

A Student **HAS A** Grade.

A Worker **HAS A** Salary.

IS A relationships:

A Student **IS A** Person.

A Worker **IS A** Person.

'Has A' relationship takes on significance in our coding project. Values that use a "has a" relationship represent instance variables in our code.

'Is A' relationships also take on significance. 'Is A ' is used when one thing is a more specific version of another thing. These represent class hierarchies.

Exercise

1. In the following examples, fill in the relationship between the fields as either a 'Has A' or an 'Is A':

Chicago _____ city.   Dog _____ animal.

Car _____ tire.   Circle _____ shape.

Orange _____ color.   Square _____ width.

Dog _____ name.   Recipe _____ ingredient.

2. Think of additional Is A Relationships. Write down 5 additional examples and take note of which one is a more specific version of the other.

Specific	**General**
Example: Tesla	*Example: Car*
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Are these relationships symmetrical? In other words, can we say that 'All Teslas are Cars' *and* 'All Cars are Teslas'? Are any of the relationships above symmetrical?