Inspiring Greatness

ISD

INDEPENDENCE SCHOOL DISTRICT

Computer Science Virtual Learning

HS Computer Science A

May 20th, 2020

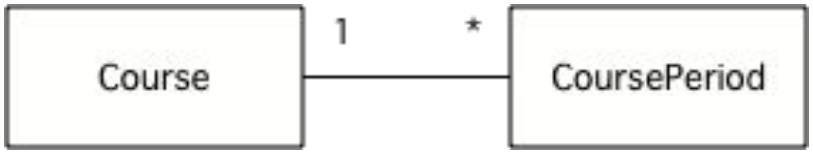
Lesson: Association vs Inheritance

Objective/Learning Target:

Understanding what the difference is between Association and Inheritance

What is Association?

Another type of relationship between classes is the has-a relationship or association relationship. Use this when the object of one class contains a reference to one or more of another class. For example, a course can have many course periods associated with it as shown below. The 1 near the Course means that 1 course object is associated with the number shown near the other class. In this case it is * which means 0 to many. So one course is associated with 0 to many course periods.



What is Association?

This would typically translate into a field in the Course class that has an array or list of CoursePeriod objects. The CoursePeriod class would have a field that is of type Course as shown below.

```
public class Course
{
   private List<CoursePeriod> periodList;
}

public class CoursePeriod
{
   private Course myCourse;
}
```

Substitution Test for Inheritance

If you aren't sure if a class should inherit from another class ask yourself if you can substitute the child class type for the parent class type. For example, if you have a `Book` class and it has a subclass of `ComicBook` does that make sense? Is a comic book a kind of book? Yes, a comic book is a kind of book so inheritance makes sense. If it doesn't make sense use *association* or the *has-a* relationship instead.

Only use inheritance when the child class is really a type of the parent class, otherwise use association.

Check Your Understanding

1. A bookstore is working on an on-line ordering system. For each type of published material (books and movies) they need to track the id, title, author(s), date published, and price. Which of the following would be the best design?

A. Create one class PublishedMaterial with the requested fields plus type
B. Create classes Book and Movie and each class has the requested fields
C. Create the class PublishedMaterial and have Book and Movie inherit from it all the listed fields
D. Create one class BookStore with the requested fields plus type
E. Create classes for PublishedMaterial, Books, Movies, Title, Price, ID, Authors, DatePublished

2. A movie theater has multiple showings of a movie each day. Each movie showing has a start time and location (theater number). What should the relationship be between the Movie class and the MovieShowing class?

A. The MovieShowing class should be a subclass of the Movie class.
B. The Movie class should be a subclass of the MovieShowing class.
C. A MovieShowing has a movie associated with it, so it should have a Movie field.

3. What Java keyword is used to specify the parent class?

A. superclass
B. parent
C. extends
D. class

For More Resources and to Check Answers

Go to: https://runestone.academy/runestone/books/published/apcsareview/OOBasics/ooAssocVsInherit.html