

Computer Science 22: Object Oriented Programming

Lecture #5: Objects and Classes III

About This Lecture

- Object Creation / Destruction
- Using Objects
 - Accessing Properties
 - “Invoking”/”Calling” Methods / “Passing” messages
- Code Examples in Different Languages
- Summary

Classes and Objects

Student

```
String name;  
String studentNumber;  
String college;  
String curriculumCode;  
List grades;
```

```
computeGWA()  
changeCurriculum()  
addGrade()  
changeGrade()
```

x:Student

```
name = Mary M. Ary  
studentNumber = 2010-12345  
college = CAS  
curriculumCode = BSCS-2008  
Grades = {{CMSC 11, 1.75, SEM2, 2008},  
           {CMSC 56, 1.50, SEM2, 2008},...}
```

Classes

- Classes define the properties and behaviors that the objects that belong to it have.
- A class is a structure composed of
 - Data (instance and class variables)
 - Operations/Methods that manipulate its data (instance and class methods)

Object Instantiation

- “Instance” = “Object”
- To instantiate means to create / *initialize*
- We use specialized methods called **constructors** to create objects in our programs
- Constructors allocate memory space to be used by the object
- Constructors also initialize attribute values (i.e., set the object in its initial state)

Destroying Objects

- **Destructors**

- Specialized methods that deallocate memory
- May be implicitly or explicitly called (i.e., in C++)

“Invoking”/ “Calling” Methods

- You can “invoke” methods of objects (as defined in their respective classes)
- Note that in OOP, when calling methods you may have to
 - Specify first the instance/object you are calling the method in (i.e., instance methods); or
 - Specify that class where the method belongs (for class methods)

Summary

- What is a class?
- What is an object?
- What is abstraction?
- What are the parts of a class?
- What is the difference between an instance variable and a class variable?
- What is the difference between an instance method and a class method?
- What are constructors? What are destructors?