COMP90041

Programming and Software Development

Semester 1, 2021

Lab 4

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Outline

- Classes
- Constructors
- Overloading
- Automatic Type Conversion
- Public and Private Modifiers
- Accessor and Mutator Methods
- Exercises

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Classes

- A class is a Type
- A special kind of programmer-defined type
- Variables can be declared of a class type

Java Class Structure

```
//  comments about the class
public class MyClass
{  //  comments about the variable
   Account myVar

   //  comments about the method
   public int myMethod (String arg)
   {
   }
}
```

method body

method header

- A value of a class type is called an object or instance of the class
- A class determines the types of data that an object can contain, as well as the actions (methods) it can perform

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Constructors

- A constructor is a special kind of method
- Initializes the instance variables for an object
- Of the form
  - public <Class Name>(*params) {
    - <code>
  - }
- Must have the same name as the class
- Cannot have a return type

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Constructors

- Gets called when an object of the class is created, i.e.
  - <Class Name> classObject = new <Class Name>(*args);
- If we ignore or forget constructor, Java automatically creates a default no-argument constructor, which:
  - Takes no arguments
  - Performs no initializations
  - But allows the object to be created

- However, usually we create our own no-argument constructor

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Overloading

- When two or more methods in the same class have the same method name
- Must have different method signatures
- Method signature = method name and list of types for params
  - I.e. return type must match!

```
public void setDate(int month, int day,int year)
public void setDate(String month, int day,int year)
public void setDate(int year)
```

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Automatic Type Conversion

- If Java cannot find a method signature that exactly matches a method invocation, it will try to use automatic type conversion
- Aims to find a method definition that matches the (type cast) types of the method invocation

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Public and Private Modifiers

- Public => no restrictions on access
- Private => cannot be accessed by name outside of the class
- Good practice to make all instance variables private
- Methods that only exist to help other methods are typically made private

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Accessor and Mutator Methods

- Accessor (getter) => obtains the value
  - The data can be accessed but not changed
  - The name of an accessor method typically starts with the word get

- Mutator (setter) => changes the value
  - Incoming data is typically tested and/or filtered
  - The name of a mutator method typically starts with the word set

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Exercises