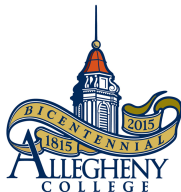# CMPSC 112
Lecture 5: Inheritance

Dr. Aravind Mohan

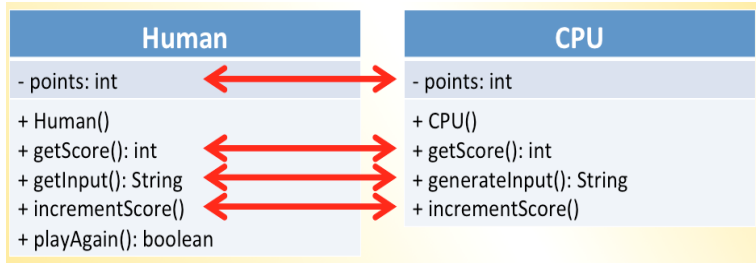Allegheny College

September 14, 2017

Last Time

- Abstraction and Encapsulation (Deeper view)
- Design of three classes: Human, CPU, and Game
- Implementation of the Human and Game classes
- Implementation of the Computer class

Reminder: Mastery Quiz.

Discovered Issue

- The Human and CPU classes shared a bunch of functions. Lots of extra typing.
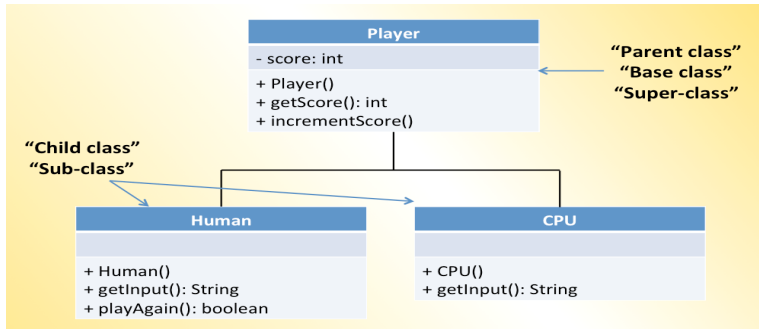
Inheritance

- Definition: A programming technique or mechanism for creating a hierarchy of classes.
- Practical approach: Put everything that is shared in a parent class, and leave everything that is different in the child classes. Give the original class access to things in the new parent class.

What Does the Subclass Do?

- The subclass automatically inherits all methods from the superclass.
- The subclass can augment the superclass by adding new variables and new methods.
- The subclass can also specialize superclass behaviors by providing a new implementation that overrides an existing method.

Inheritance

Player

- score: int

+ Player()
+ getScore(): int
+ incrementScore()

"Parent class"
"Base class"
"Super-class"

"Child class"
"Sub-class"

Human

+ Human()
+ getInput(): String
+ playAgain(): boolean

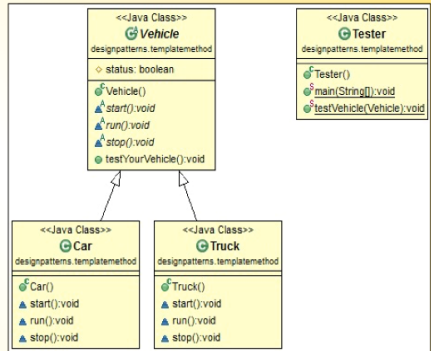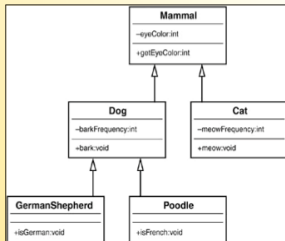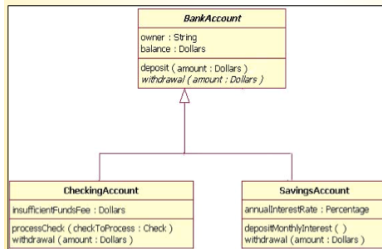**CPU**

+ CPU()
+ getInput(): String

Accessing Variables

- Accessor or "getter" - Public function that provides read access to a private variable.
- Mutator or "setter" - Public function that provides write access to a private variable.

Code Changes

- Access control -¿ private vs protected
- Overriding functions

Other Inheritance Examples

Reading Assignment

- GT Chapter 2.2

Any Questions

- Reminder 01: REVIEW FORM
  Reminder 02: Think of project ideas. What would you like to do for your final project? (10% of your grade). [1]

  1. Requirement to work in team. So find your team partners. Team can be either 2 members or 3 members.
  2. Project evaluation will be done based on project presentation. More details will be provided later.
  3. Deadline for project proposal document (1 paragraph explanation of your project and the team members info is due **October 12th**)
  4. Project presentation will be on **December 7th**) (tentative)

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[1] (You are welcome to discuss wih me regarding your project, I can give you some ideas that would help you to build some REAL Industry standard project, which could help you to add juice to your resume and also help develop a strong platform to work with me on a series of projects, such as independent study, summer work, advance classes, junior and senior thesis, etc..)