

Computer Programming CS-182



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Logistics

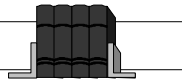
- Schedule (Office hours)
Textbook
World Wide Web
Listserv
Tutoring
Quizzes
Exams
Lab projects
Grading
Quality assurance

Course Topics

- Object-oriented development (An introduction, More in later courses)
OO analysis
OO design
OO programming

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Course Topics



- **C++ language**
 - Use of existing classes
 - Class construction in CS-183
- **Standard Template Library**
 - Introduction (more later)
 - Containers, algorithms
 - ANSI C++ strings

What is Software Development?

- **Computers not smart**
 - Hardware does what it's told (?)
- **Software (program)**
 - Step-by-step instructions
 - Data values

What is OO Development?

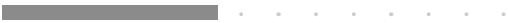
- **Programs as models**
 - Of real-world "things" (objects)
 - Like a map models highways
- **Like script of a play**
 - Cast of characters
 - Environment
 - Things characters do (behavior)



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Building the OO Model

- **Study problem specification**
- **Identify objects**
 - Attributes
 - Behaviors
- **Consider interactions**
 - Relationships

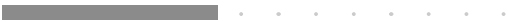


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Identifying Objects

- **Person, place, thing, ...**
 - Nouns (look in problem description)
- **Physical objects**
 - Simple or complex
- **Less tangible objects**
 - E.g., vehicle title

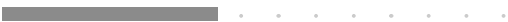


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Attributes

- **Object characteristics**
 - Person: name, height, birth date
- **Property of each object**
 - For a given type (class) of object
- **Attribute value**
 - Unique to each object (instance)



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Behaviors

- **Things an object can do**
 - Plane: take off, land (verbs)
- **Common actions**
 - Shared by all objects of same type
- **Variations in common action**
 - Not all planes fly at the same speed

Model versus Reality

- **Real-world objects**
 - Often very complex
- **Model (software) objects**
 - Simplify real-world reality
 - Omit irrelevant details
- **A process of abstraction**
 - Key tool in computer science

OOA, OOD, OOP

Text, page 6

- **Object-oriented analysis**
 - Describe what is to be done
- **Object-oriented design**
 - Describe how it is to be done
- **Object-oriented programming**
 - Implement the design
