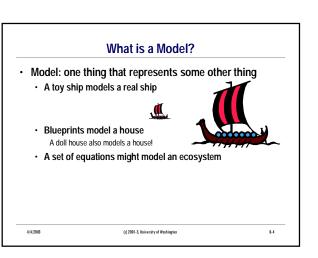


What is Computer Science? • What some people say: • "Computation" • "Formal system" • "Abstraction" • "Building computers" • "Programming", "Software Development", "Software Engineering" • • Often it come down to modeling



CSE142 Wi03 B-1

What is modeling?

- · What are some more examples of models?
- · Why do people make models?

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B-5

Programming as Modeling

- · Take something real (bank, ship, house, University)
- Make a model in software of its objects, parts, relationships, etc.
- · Or... take something imaginary (video game world, scientific theory)
 - Even though imaginary, it has objects, features, parts, relationships, etc.
- Make a model in software of its (imaginary) objects,
- · Philosophical question: is the model itself real?

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8-6

8-8

What Can Get Modeled?

- Objects
- · Parts of Objects
- Data
- Features
- Actions
- States
- · Changes over time
- Patterns
- · Relationships between the above

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Overview of CSE 142

- · We'll learn how to model...
 - Objects
 - · Relationships
 - Patterns
 - Data
 - · Computation
- ...while learning how to create software systems using the Java programming language

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8-7

The World of Objects

- The *object* is the basic unit of modeling in modern programming systems.
- We'll learn to think about properties and responsibilities of objects
 - · Properties: information relevant to the object
 - · Responsibilities: tasks an object performs
- We'll learn to think about how objects relate to each other in a system
- Note: Modeling the world with objects in software is called *object-oriented programming*.

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Student Example

- · You are a student
- Let's model a student object in the context of a course registration system
- · Name examples of relevant properties:

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Student Example (cont.)

 What are some responsibilities (tasks) for the student in a course registration system?

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Retail Store Example

- Let's model a system to store inventory of a retail store that sells men's and women's shoes
- · Give some examples of objects in the system

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CSE142 Wi03 B-3

B-11

Retail Store Example (cont.) - Object Properties Responsibilities

Summary

- Building a piece of software is a form of modeling
- · Model-building is a common human activity
- Modeling involves identifying objects and discovering their properties and relationship
- Modeling the world with objects in software is called object-oriented programming.

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CSE142 Wi03 B-4