

Unit 1: Some Assembly Required

Preview of Coming Attractions

In this unit be sure to look for

- the organizing theme of the CSE 2221/2231 course sequence.

Building by Assembling

It's 9:00 am Monday morning, the first day of class for "How To Build It 101". The instructor announces that each student will need to build a bicycle in order to pass the class. More than that, the "bike" assignment is due at the start of class on Friday, just four days from now! Well, an announcement like that would send most of us packing. But just as you are about to reach the door, on your way to drop "How To Build It 101", the instructor begins to pass out catalogs of bike parts, things like tires, rims, frames, brakes, sprockets, and so forth. For the assignment you are allowed to order parts from the catalog, and they will be delivered the next day, guaranteed. So you calm down, return to your seat, make out a parts list, and begin to think that this assignment might actually be fun.

The next week, while riding your new bike across campus, you think back to the experience of building the bike. Each component came with an excellent description of what it could do and of how to assemble it into a bike "system", and you put together a really cool bike in a fairly short time. It was amazing how much you accomplished, and how quickly, by assembling the "off-the-shelf" components. Just then the dark thought of building the bike from scratch flashes through your mind and, shuddering at the thought, you almost run off the bike path. Quickly forcing your mind back to happier thoughts, you have one of life's "aha" experiences: The bike assignment was not just about building a bike; but rather, it was about the bigger idea of "building by assembling". Other



examples immediately come to your mind: automobiles, electronic appliances, buildings, personal computers, and lawn mowers. “Yup”, you say to yourself, “building things out of off-the-shelf components is definitely the way to go”.

And so, you’ll be pleased to learn that the *fundamental organizing theme of the CSE 2221/2231 course sequence is building software out of off-the-shelf components.*

Instead of promoting the idea of building software from scratch, we’ll emphasize the more modern idea of assembling components into high-quality software. But that’s not the whole story. Since we are the computer scientists of the world, one of our major responsibilities will be to “stock” the shelves themselves with useful, high-quality components. So we’ll spend a lot of time focusing on components, and we’ll learn how to design, specify, implement, analyze, and reason about reusable software components.



Still Awake?

1-1. Imagine a car rolling down the assembly line. List some of the components that will be used to assemble the car. Which of the components do you think are manufactured from scratch at the assembly plant?

1-2. We know that student housing can sometimes be a little lacking. Nonetheless, take a look around your room and list some of the components that were assembled to build your room.

1-3. Suppose you were to select components for your dream computer. What components do you think you’ll need to select? Which of the components do you think are built from scratch by the computer company that puts the system together?