Data Structures on the Web

NGI PROJECT PRESENTATION for SUMMER 2002

Presented by Neha Kumar
Advised by Prof. Michael Clancy

Agenda

- Data Structures today
- What is WISE?
- Data Structures in WISE
- Why WISE?
- Long-term objectives

Data Structures today

- 3 hours of lecture - They listen
- 2 hours of lab - They start to experiment...
- 1 hour of discussion - They listen
- hours of homework - They struggle

What they don't do enough

- Learn by experimenting
- Test their learning
- Recognize gaps in their knowledge

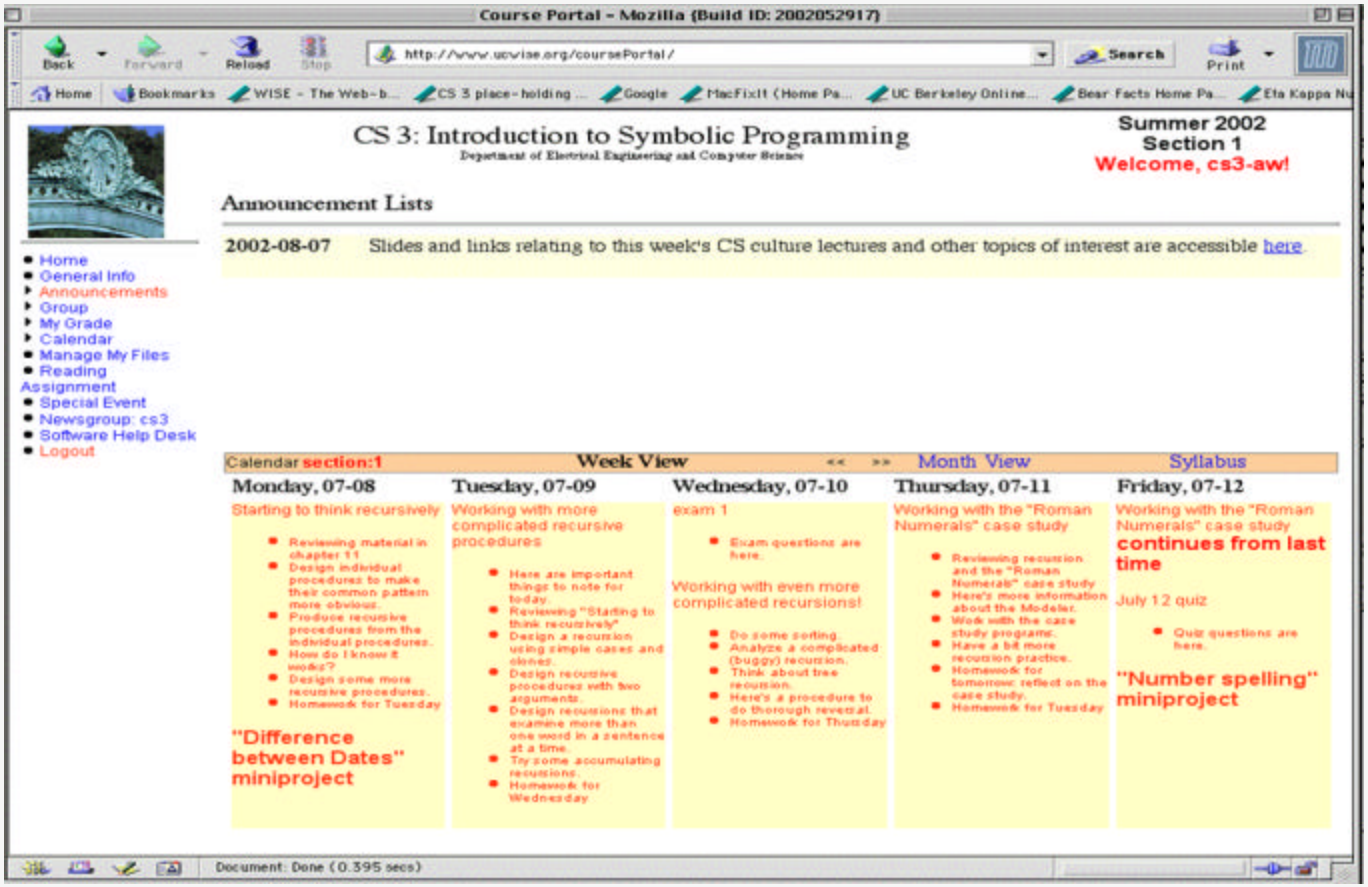
What is WISE?

- Web-Inquiry Science Environment
- Collection of activities for students
- Online database of learning material

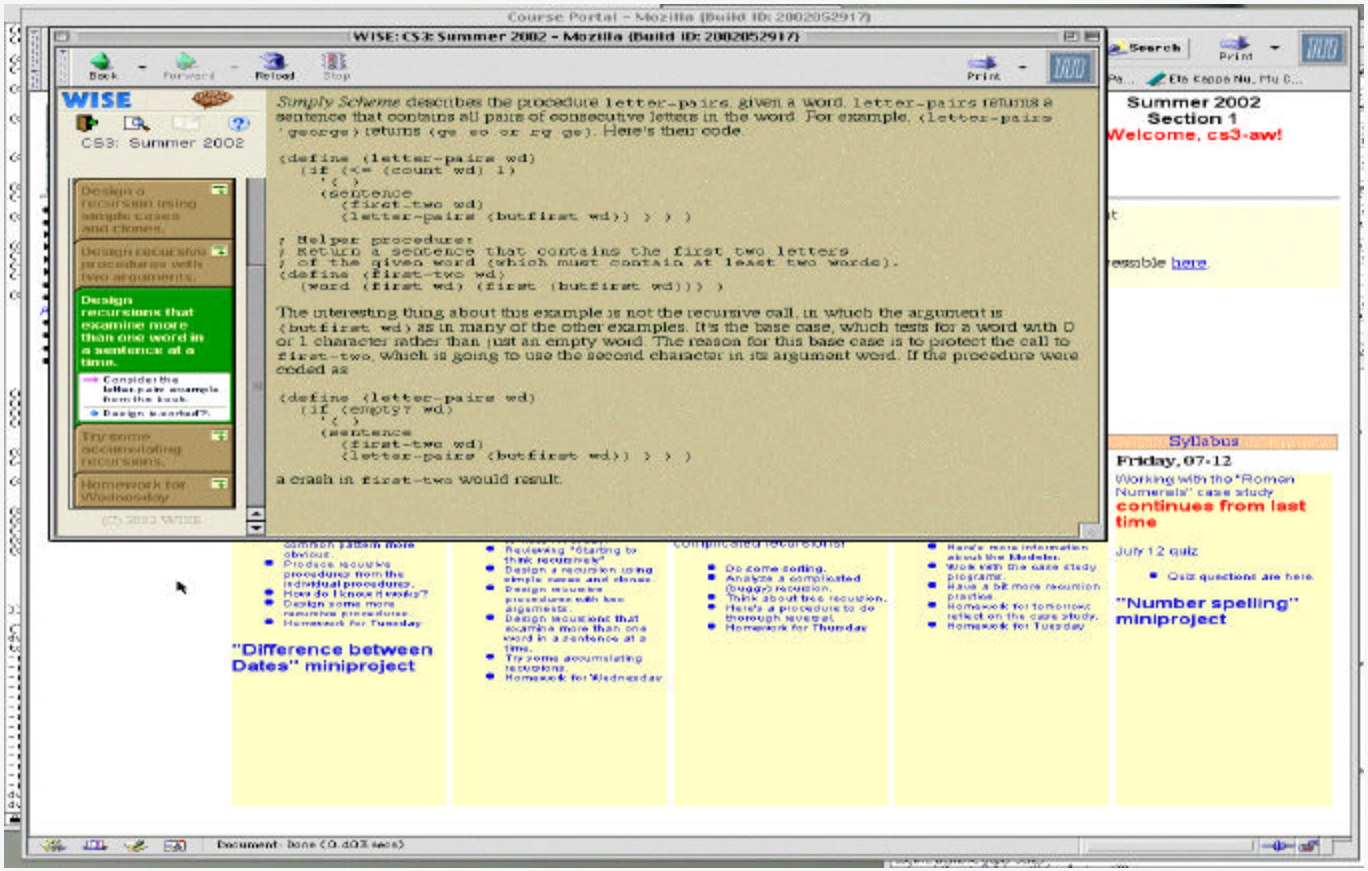
Activities in WISE

- Online reading
- Assessment exercises
- Quizzes
- Online discussions
- Brainstorming sessions

The WISE CS3 Course Portal



The Learning Environment



Data Structures in WISE

- Course divided into topics called “Projects”
- Each “Project” has its set of “Activities”
- Each “Activity” is divided into “Steps”

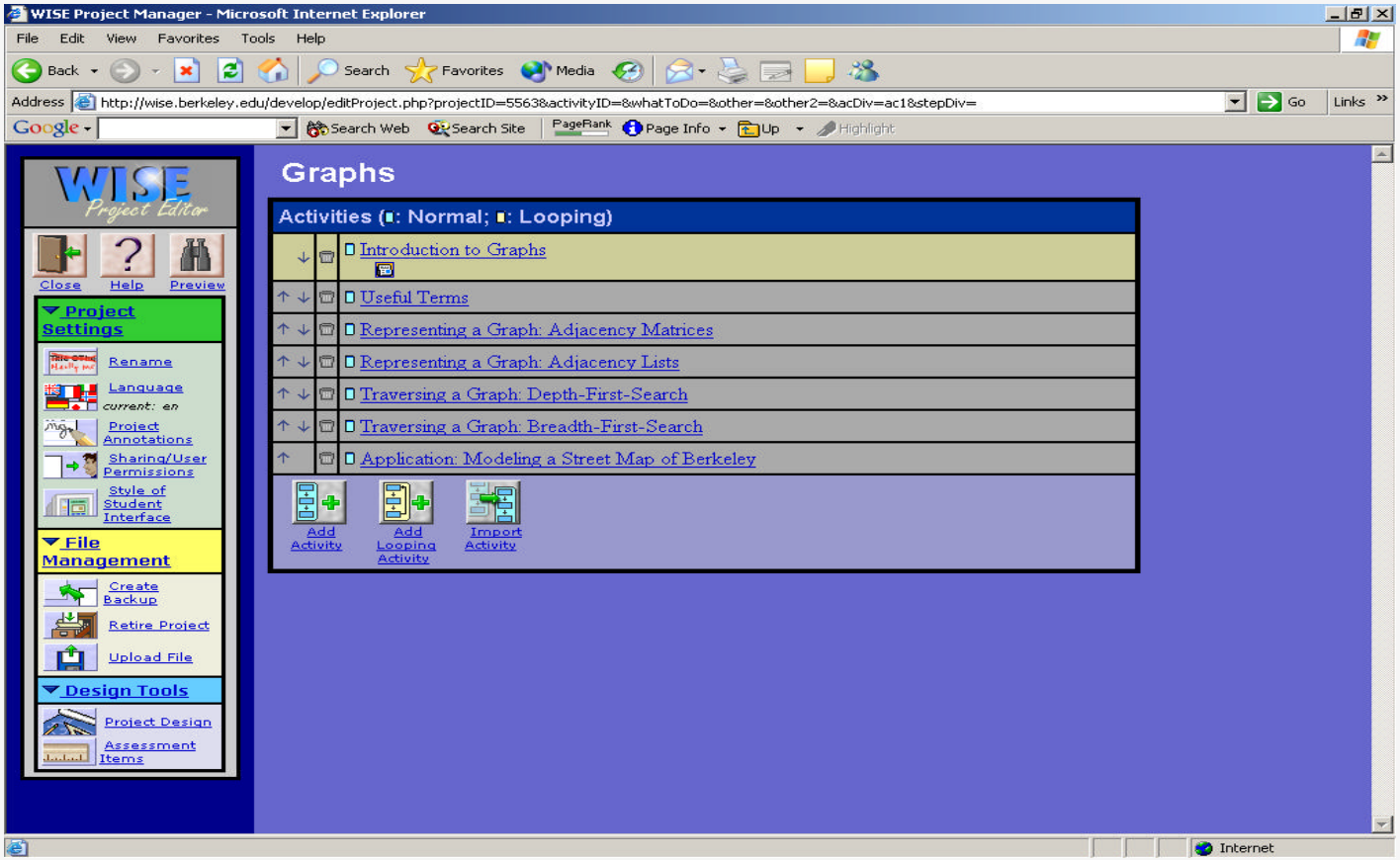
WISE Projects for 61B

- Java Programming
- Activation Records
- Inheritance
- Exceptions
- Testing
- Linked Lists & Arrays
- Game-tree Search
- Asymptotic Analysis
- Hash Tables
- Trees
- Binary Heaps
- Binary Trees
- 2-3-4 Trees
- Graphs
- Sorting Algorithms
- Randomized Analysis

Close-up on Graphs

- Project: Graphs
  - Introduction
  - Terms to Know
  - Representation: Adjacency Matrices and Lists
  - Traversal: DFS and BFS
  - Homework: Modeling a Map of Berkeley

Creating a project in WISE



WISE and 61B: how they fit

- Activities proceed in small steps
- WISE activities enable thorough learning
- Progress is easy to monitor
- Weaker students get individual attention
- Students benefit from group discussions

- They learn by doing!

Why WISE?

Studies done over the summer show

- Students find WISE more enjoyable
- They perform better overall

“I like the way lectures are combined with problems online. I am learning more about CS than I ever did before. This method of teaching is very practical and works a lot better than regular lecture/lab/discussion sections...” - Summer CS3 Student

Long-term Objectives

- Adapt WISE to all lower-division CS courses
- Export curriculum to UC Merced