Math 203
Plans for Chapter 3
Planning and Scheduling

Chapter Objectives: Study scheduling and packing problems with limitations on the number of simultaneous tasks or on bin size. Learn the list processing algorithm, several bin-packing algorithms, and the sometimes advantages of sorting into decreasing size.

- Assignment already made:

  Homework Problems: Chapter 2, #54bc, 56, 58.
  Reading: Pages 72-85.
  Reading Homework: Write a few sentences explaining when we would need to use the List Processing Algorithm (instead of just finding critical paths, as in Chapter 2) to find out how long it will take to complete a collection of tasks.

Day 1: 1. Go over homework.
2. Make certain the notions of order-requirement digraph, critical paths and earliest completion time from problems 54 and 56 of chapter 2 are well understood. They are used in this chapter also.
3. Discuss the notions of the list processing algorithm and critical path-schedules.
4. Work problem 10(b) as an example. (You’ll probably want to do 10(a) first as background.)
5. Have the students work on 10(c) in groups.
6. Assignment:
  Homework Problems: Chapter 3, #7, 8.
  Reading: Reread Pages 72-85 and also Read Pages 86-89.
  Reading Homework: Chapter 3, #26a.

Day 2: 1. Go over homework. (This could take awhile.)
2. Discuss independent tasks. You might want to have the students redo 8a and 8b as independent tasks (i.e., ignoring the order-requirement digraph).
3. Assignment:
  Homework Problems: Chapter 3, #24, 25, 26.
  Reading: Pages 90-98
  Reading Homework: Chapter 3, #36a.

Day 3: 1. Go over homework.
2. Explain the idea of bin-packing and briefly discuss the six heuristic bin-packing algorithms: next, first, worst fit and the decreasing versions, using problem 36 as an example.
3. Break into groups and have the students work on worksheet M3a. A few notes are in order:
   • You may want to do this problem before you discuss the heuristic algorithms.
   • This problem is hard, but well within the reach of our students. They may need a bit of prodding.
   • This problem also works well with capacity 25, and the list 20, 19, . . . , 2, 1.
   • Obviously, the key is for the student to finally be free of the sometimes inflexible algorithms and do what may (or at least should) come naturally. After that, the student is faced with the generalization of what happens in the end. How much “extra” is left over from each copy of the list, and how often does that “extra” fit perfectly?
   • Be sure to leave some time, either today or during the next class period, to discuss this problem.
4. Assignment:
  Homework Problems: Chapter 3, #33, 34, 35.
  Reading: Pages 164-175 (This is Chapter 5!)
  Reading Homework: Chapter 5, #2.