Final Review

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Although the final will focus on material learned since Quiz 2, no material is off-limits. This review handout covers the material taught after Quiz 2.

1 Dynamic Programming

1. When would you use dynamic programming? What types of problems does it help solve?

2. What is optimal substructure?

3. What are overlapping subproblems?

4. Describe the top-down and bottom-up approaches to solving DP problems.

5. What is memoization? How does it help us solve DP problems?

6. How does dynamic programming relate to DFS? What are the vertices and edges in the subproblems graph?

For some practice DP problems, see http://people.csail.mit.edu/bdean/6.046/dp/.

2 Numerics

1. What does it mean for equations to be overconstrained? underconstrained?

2. Describe how to translate a system of equations into matrix format.

3. What is an upper triangular (UT) matrix? How does having a UT matrix help us solve linear equations?

4. Describe the procedure for performing a Givens rotation? How does this rotation modify the matrix?

5. How do we form an upper triangular matrix by using Givens rotations? Does the ordering of rotations matter?