CS 423: Theory of Algorithms
Spring, 2000 Handout **#2**
Tarjan

Course Information

Lectures Tuesday and Thursday 10:30 – 11:50 a.m.
Room 104 (Large Auditorium, Computer Science Building

web page: http://www.cs.princeton.edu/courses/archive/spring00/cs423/

Instructor:	Robert E. Tarjan	Secretary:	Sandy Barbu
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Assistants:	Zhiyan Liu	Jessica Fong
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Description:
This course is designed to provide students with an understanding of the principles and techniques used in the design and analysis of computer algorithms. The course is primarily theoretical and does not require programming, but it does require understanding of the notion of a mathematical proof and some knowledge of elementary discrete mathematics. We will discuss and analyze a variety of data structures and algorithms chosen for their importance and their illustration of fundamental concepts. We shall emphasize analyzing the worst-case running time of an algorithm as a function of input size. We shall also spend some time exploring the boundary between feasible computations, taken to be those doable in polynomial time, and infeasible computations. This will include discussion of the notorious $P = NP$? question.

Prerequisites: COS226 and COS341, or permission of the instructor.

Required Text:

Corman, Leiserson, and Rivest, *Introduction to Algorithms*, MIT Press, 1990.

Useful Sources:

Garey and Johnson, *Computers and Intractability: A Guide to the Theory of NP-Completeness*, W. H. Freeman & Co., 1979.

Tarjan, *Data Structures and Network Algorithms*, Society for Industrial and Applied Mathematics, 1983.

Kozen, *The Design and Analysis of Algorithms*, Springer-Verleg, 1992.

Cupillari, *The Nuts and Bolts of Proofs*, PWS Publishing, 1993

Coursework:

There will about five problem sets based on material in the book or covered in lectures. There will be a take-home midterm, and a final extra-credit exercise. The problems will range from medium-hard to challenging. You should not necessarily expect to solve all parts of all problems, but you should read, think about, and try hard to solve all of them, allowing yourself plenty of time before the problems are due to think about and work on them.

Help on Problem Sets:

You will be graded both on the correctness of your solutions and on the clarity and conciseness of your exposition. As a general rule, you may discuss the problems with others and consult reference materials, unless this is specifically disallowed for the problem or problem set. However, your solution write-ups should be entirely your own, and you should carefully cite outside sources of ideas, whether they are friends, research papers, or books. To learn the most, you should first try each problem entirely on your own, without outside help.

Late Problem Sets:

Problem Sets will be due on Thursdays at the beginning of class. You may turn them in the following Tuesday for half credit. Any late submissions will receive no credit, unless there are serious extenuating circumstances.