

# CSC721 – Laboratory #4\*

David John

Fall 2008

This lab focuses on an approximation algorithm to a known *difficult* problem. There are two phases to this assignment: the identification and discussion of an NP-hard problem, and the use of simulated annealing to find a *solution*.

First, choose an NP-hard problem. I suggest you use one that is in Dasgupta et al [1]. You will need to clearly state what the problem is about and you will need to precisely explain why the problem is known to be NP-hard. The statement and explanation must be in your own words, though you certainly can take guidance from information in the text.

Second, on page 292 of Dasgupta et al [1] there is a sketch of an algorithm for Simulated Annealing. From this sketch develop an algorithm, with an annealing schedule, that will *solve* your NP-hard problem. I am interested in how well you think it does, and how fast does this approximation algorithm run?

This lab is due on the last day of class, December 5. You will need to meet individually with me during the exam week to briefly discuss this work.

## References

- [1] Sanjoy dasgupta, Christos Papadimitriou, and Umesh Vazirani. *Algorithms*. McGraw-Hill, 2008.

---

\*Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this document, and I am aware of a trademark claim, the designations have been printed in initial caps, all caps or italics.