Lecture 5: Materials, May 9nd

Approximation Algorithms: Vertex Cover Problem

1. **Announcement**
   Class Schedule
   - May 16th   –   No Class
   - May 23rd   –   Lecture 6
   - May 30th   –   Quiz

   Contents to be included in quiz
   (If you understand our content, then reminding yourself by reading our lecture note is enough for the quiz. The reading list below is required for students who cannot understand the content or want to know more detail about the topics.

   - **Optimization Models and Linear Programming**
     Reading: "*Formulating an Optimization Model: An Introductory Example*" (http://www.4er.org/CourseNotes/Book%20A/A-I.pdf), Page A-1 to A-17.
   - **NP-Hardness**
     Reading: "*Computers and Intractability*: A Guide to the Theory of NP-Completeness", Pages 1-11.
   - **Approximation Algorithm for Knapsack Problem**
     Reading: "*The Design of Approximation Algorithms*", Pages 13-16.
     Reading: "*15-854 Approximation Algorithms: Lecture 10 – Dynamic Programming*", Pages 1-2.
   - **Approximation Algorithm for Vertex Cover Problem**
     Reading: "*The Design of Approximation Algorithms*", Pages 16-20.

2. **Approximation Algorithm**
   Our main textbook for the first half of this course is the following book.
   Williamson and Shmoys, "*The Design of Approximation Algorithms*", Cambridge University Press, 2010.

   The book can be downloaded for free from the following URL.
   http://www.designofapproxalgs.com/book.pdf
   We have covered Chapter 1.2 and 1.3 today.

3. **Anomaly Detection Using Passive Probes**
   Our problem definition is a simplified version of the problem considered in the following paper.

   Agrawal, Naidu, and Rastogi, "*Diagnosing Link-level Anomalies Using Passive Probes*", Proceedings of the 26th IEEE International Conference on Computer Communications (INFOCOM'07), pages 1757-1765, 2007.