CS 512 Second part of the Class
Topics, Quizzes, Midterm II, Final Exam, and Class Projects

By James Abello

Hi Everyone,
So that you can plan ahead for the second part of the class, please take a note of the following "planned" schedule.

- ## Quizzes
  - **Quiz 5** (week of Oct 28): Topics: Dijkstra's algorithm, Priority queues, and Cut Property.
  - **Quiz 6** (week of Nov 4): Topics: Union-Find, Huffman encoding.
  - **Quiz 7** (week of Nov 11): Topics: Dynamic programming

- ## Midterm 2 **(week of Nov 18):**

  Topics: [DPV] Chapter 5(**Greedy Algorithms: MST's, Union Find, Huffman Encoding**), Chapter 6 (**Dynamic Programming**), Chapter 7(**Linear Programming and Max Flow** except Section 7.5)

- **Final Exam (Tentative Dec 18, 10am-1pm):** Common exam (same place/time) for sections 01, 02.

- ## Class Project

  ## Project Schedule

1. **Project Proposal Due: Nov 1:** submit on sakai following attached latex template**.**
2. **First Report: Nov 15:** submit on sakai following attached sample guidelines; present to TA.
3. **Second report: Nov 27:** submit on sakai and present to TA expanded version**.**
4. **Gala Presentation of selected projects Dec 9 -13:** TBA.

Project Topics

II. **Cryptography** (RSA-Sect 1.4 from DPV),
III. **Hashing** (Sec 1.5 from DPV)
IV. **Fast Fourier Transform** (Sec 2.6 from DPV)
V. A*, **Exploratory Search** and/or Branch and Bound
   1. Sec 9.1 from DPV
   2. "*Exploratory Search: from finding to understanding*", *CACM, 49(4):41-46, 2006, G. Marchionini*

VI. Heuristics and/or **Approximation Algorithms**: Traveling Salesman Problem, Minimum Set Cover (Sec 9.2 from DPV).
VII. **Linear Programming** (Simplex Method Sec 7.6 from DPV),
VIII. **Zero-Sum Games** (Sec 7.5 from DPV),
IX. **Clustering** (today under the umbrella of Unsupervised Learning)
X. **Algorithm Visualization** (Exclude easy algorithms such as sorting, etc.)

I. Students may produce Algorithm Snippets-Videos

To have a better idea of the quality expected from your Algorithms Snippets projects, please take a look at the following Youtube channel containing videos produced by Professor Sesh Venugopal (one of our faculty members). https://www.youtube.com/channel/UC3QLHt6mHfmg4x_h2am7ecg

The expectation is that you will work on graduate class algorithms (i.e. a bit more advanced than these ones in these videos).
Some suggested examples for this version of CS512 include:
1. Visualize Primality Testing (dpp Sec 1.3)
2. Cryptography Primer (dpv Sec 1.4)
3. Universal Hashing (dpv Sec 1.5)
4. Fast Fourier Transform

XI. Graph Visualization

References

1. *Ask Graph View, J. Abello, F. Van Ham;*
2. *CGV: C. Tominski, J. Abello,*
3. *Computational Folkloristics, J. Abello, T.Tangherlini*

XI. **SAT Solvers**

https://resources.mpi-inf.mpg.de › conferences › vtsa09 › slides › leberre1