Final Project: Genetic Algorithm with Wisdom of Artificial Crowds for NP Complete Problems

- Learning objectives. At the completion of this project, you should be able to:
  - Implement a hybrid GA+WoC algorithm for solving an NP complete problem
  - Be able to evaluate a novel algorithm for solving an NP-Complete problem.

- Problem
  - By now you have a great deal of experience in solving TSP problem using different methodologies. TSP was chosen as a classical NP-complete problem, but the skills you have learned are equally valuable for other NP-complete problems. This project is designed to give you a greater degree of scientific independence. For this project **YOU** will have to decide on a specific NP-complete problem to attempt to solve.
  - You will also need to be able to generate test data for your experiments based on the problem you select
  - A large list of potential problems is available at: http://en.wikipedia.org/wiki/List_of_NP-complete_problems
    Feel free to consult with your instructor regarding your options… but do not choose: Light Up, Sudoku, Knapsack, Mastermind, Battleship, Kakuro, Crossword Puzzle, Graph Coloring or TSP
- Hints
  - This is our last project; it is the largest and most time demanding. Allocate sufficient time to do an excellent job on it. There will be no extensions given since we are approaching the end of the semester and other deliverables will based on project 6.
  - **Due in two weeks.**
  - Your presentation and research paper (to be assigned later) will also be based on the results of your experiments from this project so a large percentage of your grade will be based on this project directly or indirectly.
  - Look at project 5 assignment for specific requirements/experiments to include in your report. Make sure you conduct enough different experiments to generate results sufficient for a research paper about solving your chosen NP-complete problem using the WoC approach.

- **Deliverables**
  - Well-commented source code for your project. You can use any language you like, but I reserve the right to ask you to demo performance of your algorithm on a new dataset.
  - Include a GUI with visual representation of the solutions for this project and incorporate snapshots in your report.
  - Project report (9-10 pages).
  - Make sure to describe the problem you are addressing in great detail.
  - Make sure you explain how test data was generated (format, etc.)
  - *Research paper (details will be announced). Presentation (details will be announced)*