CS 201: Discrete Math
2021 Fall Semester Project (Optional) Description
Due: 23:59, Jan. 10th, 2021

The goal of this project is for you to have better understandings of interesting topics in discrete math and its applications in various related areas. You are required to give a self-contained report, together with possible supplementary materials (demo, codes, etc.). The project is *optional*, and counts **5% additional** overall marks.

You are assumed to work *individually*. The project report is due on **Jan. 10th, 2021**. Each student may submit your project **directly to the homepage on Sakai**. *Please indicate* **clearly** *the references in your report. All your submissions will be evaluated individually based on your own project quality (work load, scope, clarity and organization of your report, etc.).*

The suggested list of topics includes but not limited to the following:

- *Advanced topics in logic, implementation of logic, e.g., expert system, etc.*
- *Implementation of pseudorandom number generators. You are required not only to give an implementation, e.g., using Java, but also to describe in detail what kind of the underlying method (linear congruential method) is exactly used. You are also encouraged to find possible applications. For instance, random groups generator, online "red envelope" generator, etc.*
- *Survey on standards of RSA and how RSA algorithms are used in practice, including discussion on possible attacks.*
- *State the methods of solving linear recurrence relations in the language of linear algebra.*
- *Demo of certain interesting algorithms. This may include exact steps of how the algorithm runs with given parameters. For example, (extended) Euclidean algorithm, RSA algorithm, Chinese Remainder Theorem, Roy-Warshall algorithm, topological sorting, Dijkstra algorithm, DFS/BFS algorithm, Tree traversal, Minimum spanning tree, etc.*
- *Other interesting topics of discrete math.*