Advanced Algorithms and Parallel Programming Spring 2018

Advanced Algorithms Project

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What is a Strongly Connected Component ?

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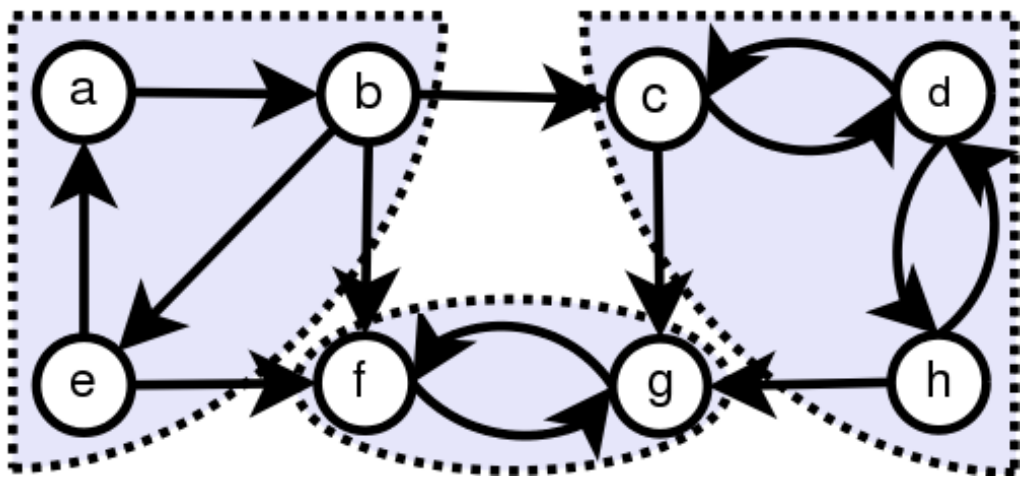

Figure: Graph with strongly connected components

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  1. Generate a Random Directed Graph with options (Python)
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  3. Debug mode for testing a singular graph with algorithms provided(C++).
  4. Visualization of the experiments, can only be done with cvs files (Python).

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- Visualization of the experiment is done with python, csv files can be further explored using the provided jupyter notebook.

Python Part

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  2. analysis.py
- They can be used outside of application

Python Part

```
yigitozgumus@Yigits-MacBook-Pro|~/dev/AAPP_Project on master!?
± python src/python/analysis.py -h
usage: analysis.py [-h] [--index I] C

Visualize the experiment results

positional arguments:
  C           The Target Location of the experiment csv file

optional arguments:
  -h, --help  show this help message and exit
  --index I   Optional file selection variable
```

Figure: Analysis script help command result

Python Part

```
yigitozgumus@Yigits-MacBook-Pro|~/dev/AAPP_Project on master!?
± python src/python/generate_graph_directories.py -h
usage: generate_graph_directories.py [-h] [--single S [S ...]] [--node N] G F

Generate directed graphs with different edge creation probabilities.

positional arguments:
  G                     Number of graphs for each edge creation interval
  F                     The Target Location of the Graph files

optional arguments:
  -h, --help            show this help message and exit
  --single S [S ...]    Single node class Graph creation for fast testing
                        between 5_50, 50_100 , 100_500 , 500_1000
  --node N              Specific Node selection for Graph Creation. This option
                        takes precedence over the Single node class selection.
```

Figure: generate graph directories script help command result

C++ Part

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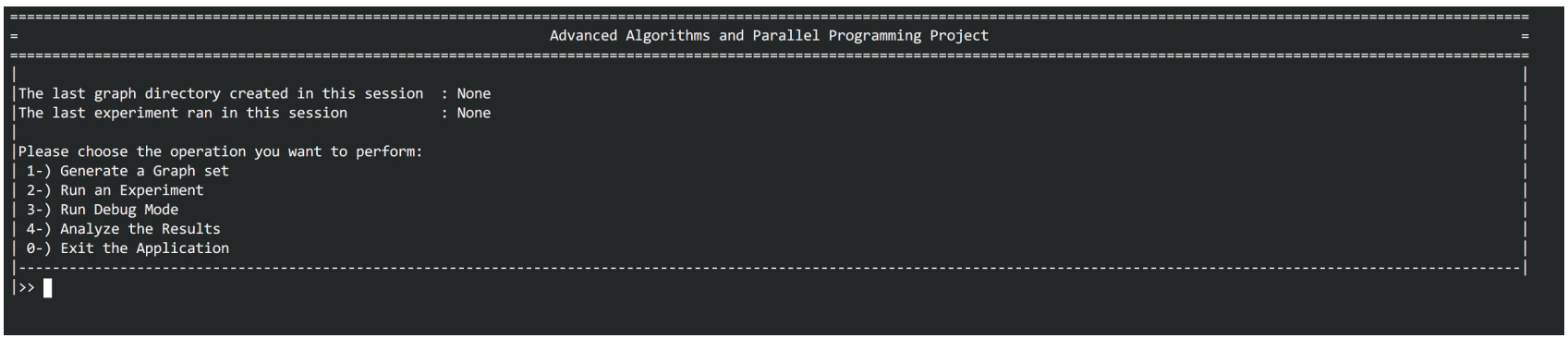
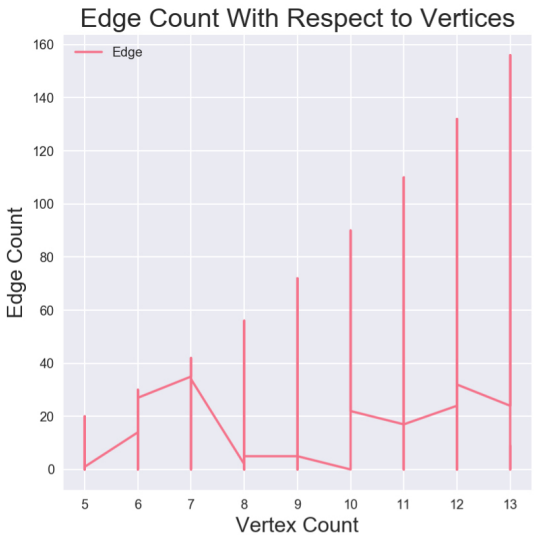
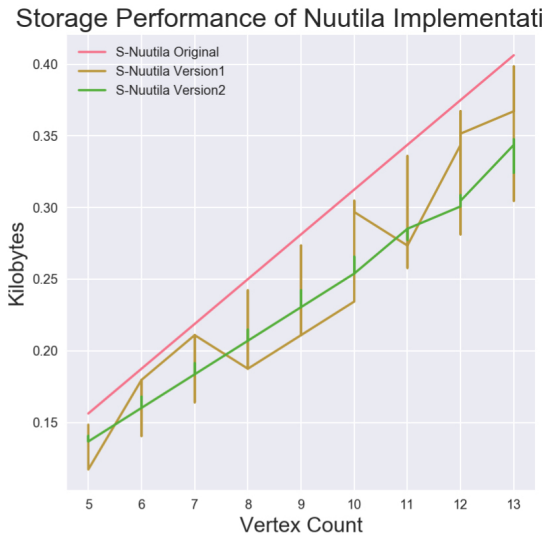


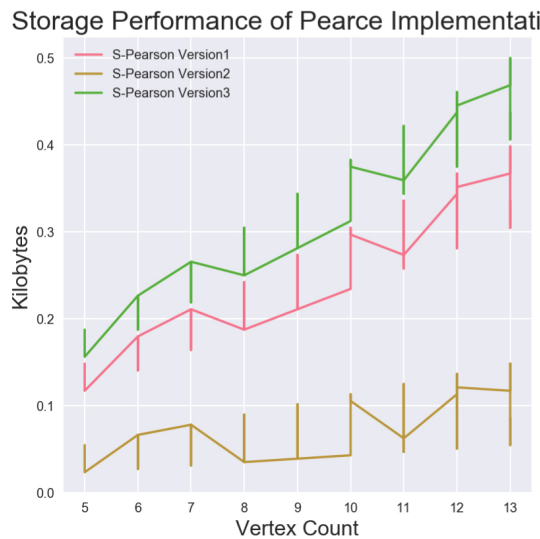
Figure: The main screen of the Application

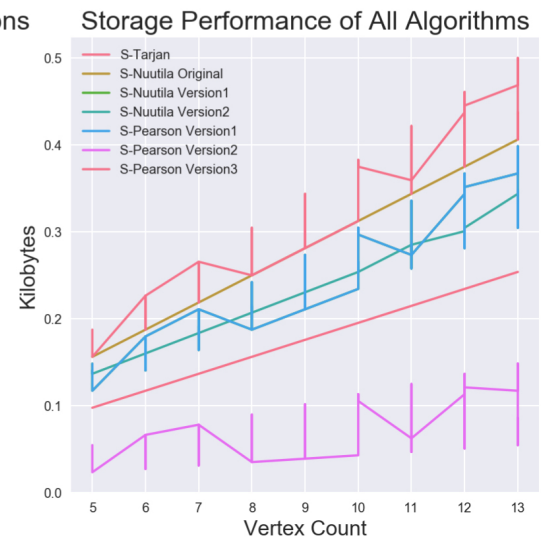
Current Section

Analysis result of the first 5000 Graphs

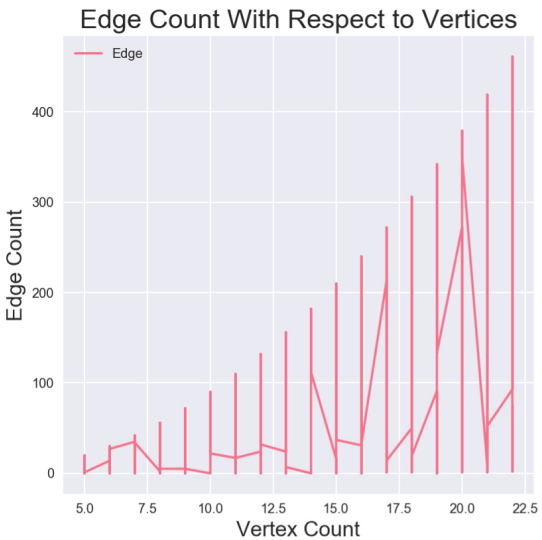


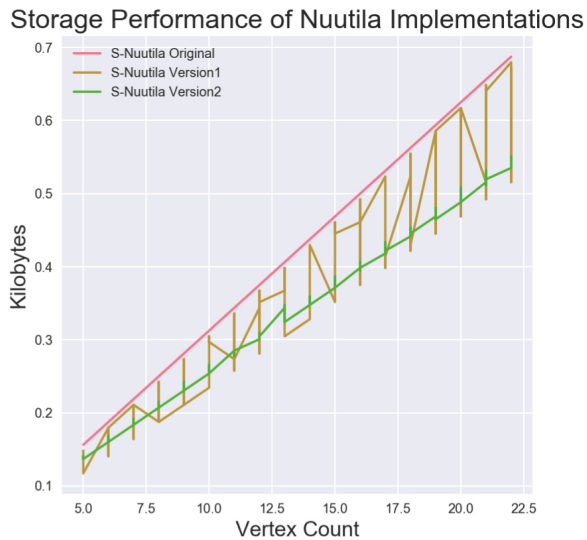


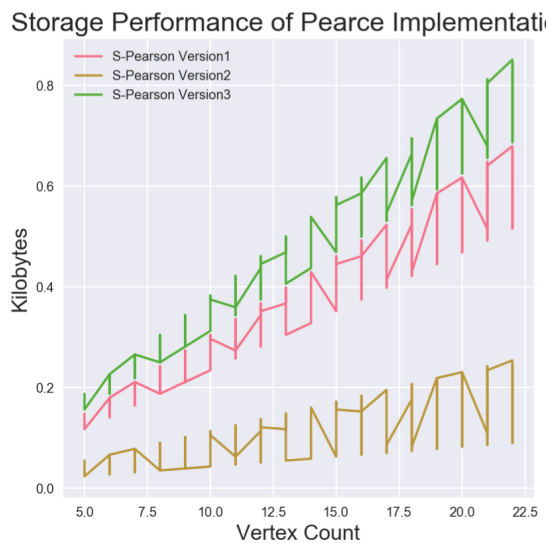


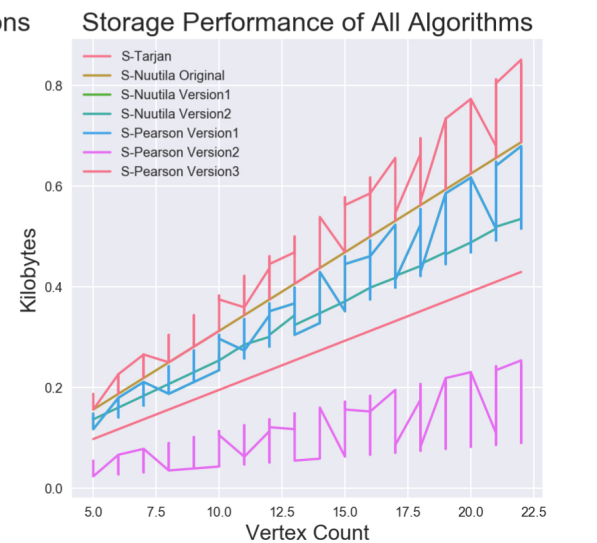


Analysis result of the first 10000 Graphs

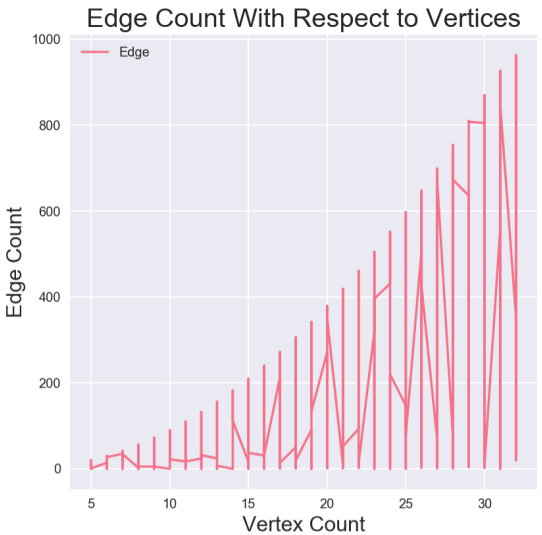


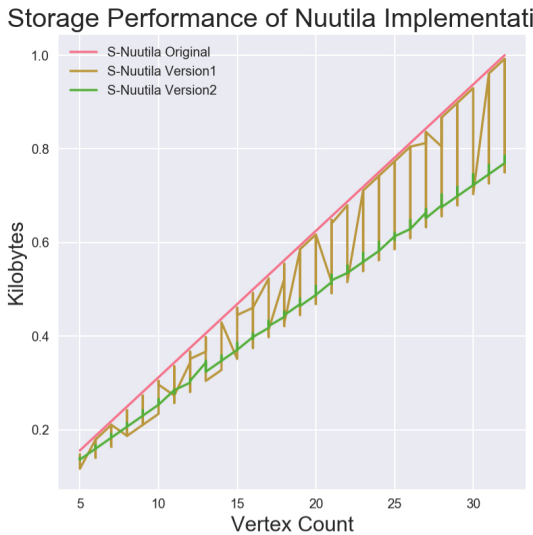


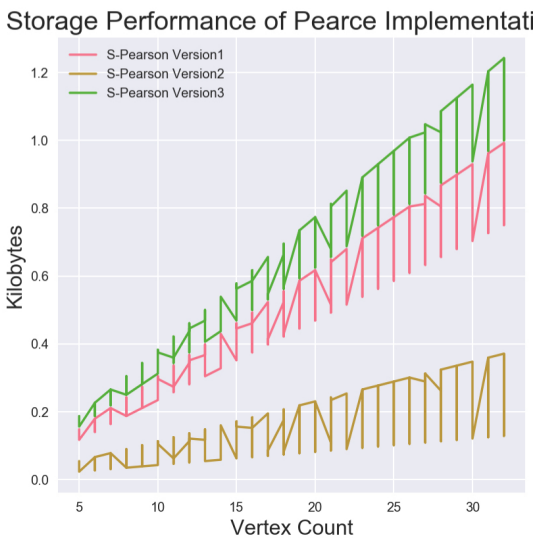


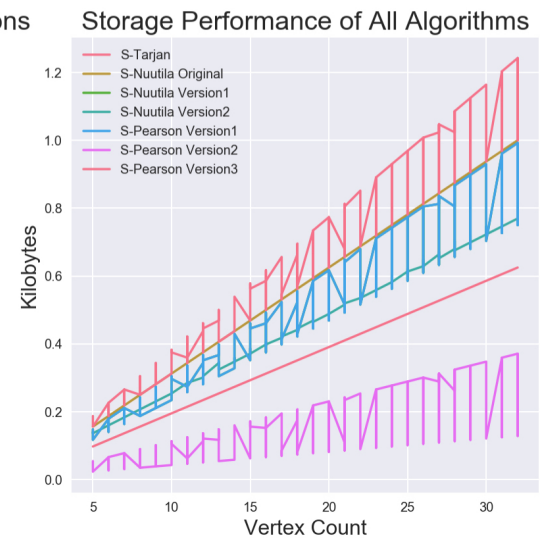


Analysis result of the first 15000 Graphs

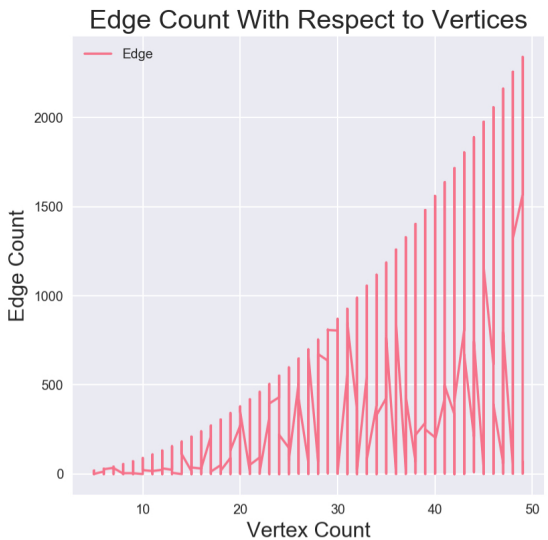


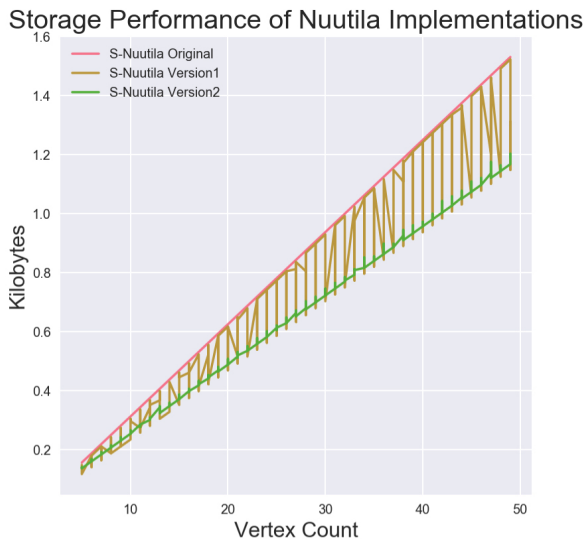


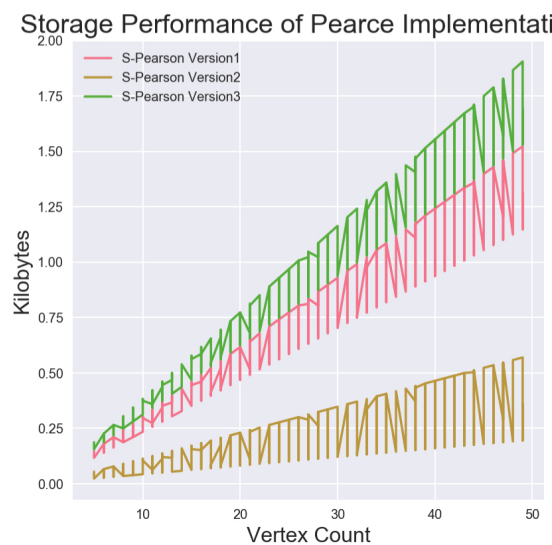


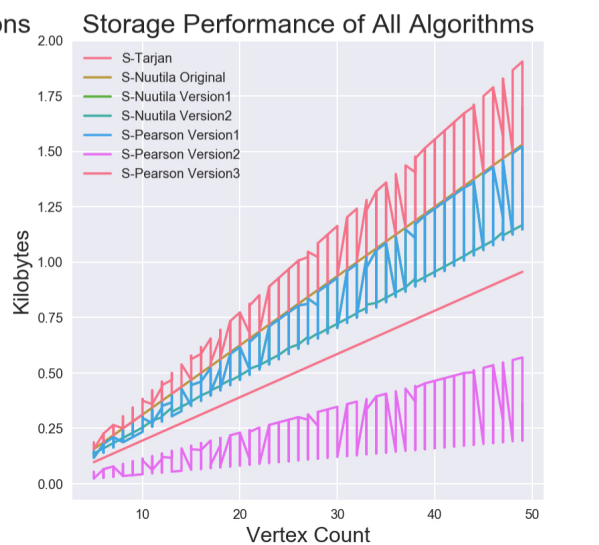


Analysis result of the first 25000 Graphs

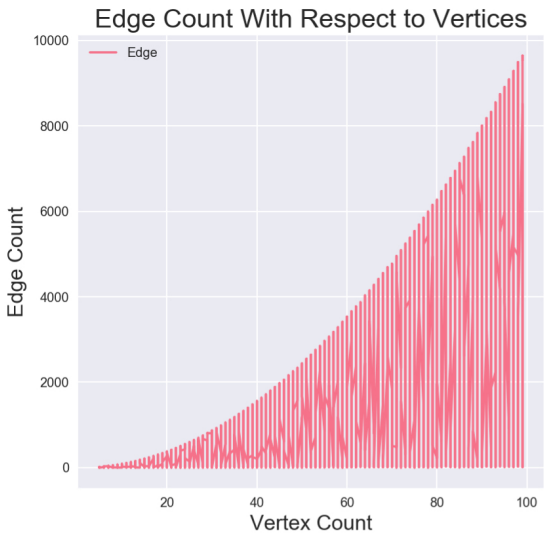


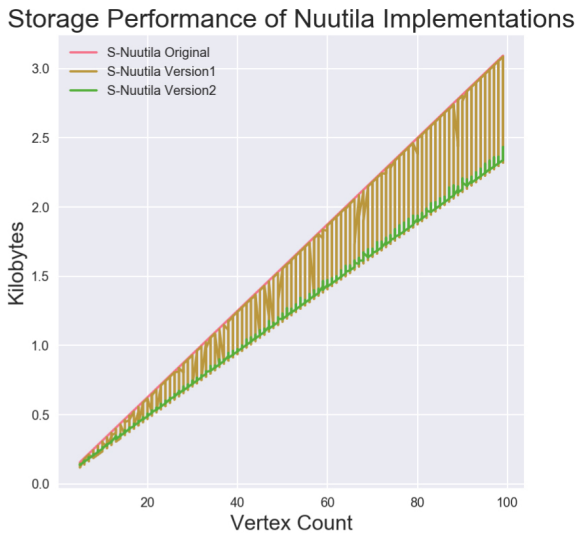


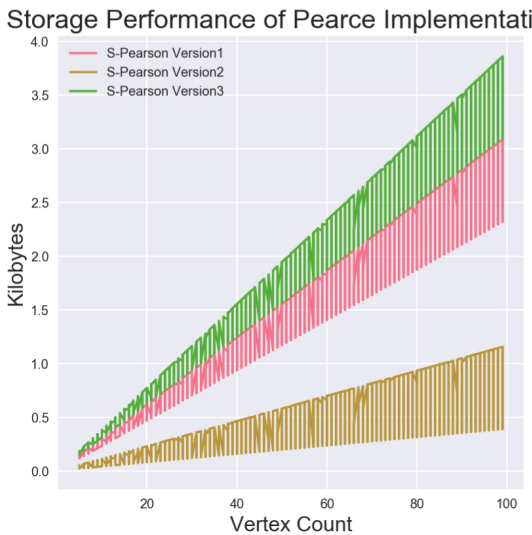


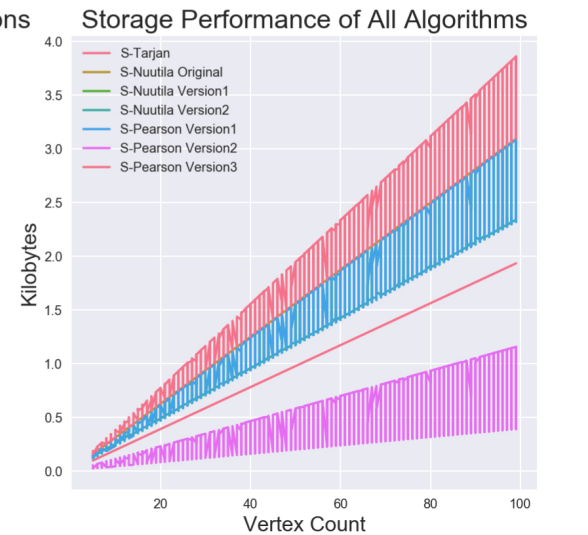


Analysis result of the first 50000 Graphs

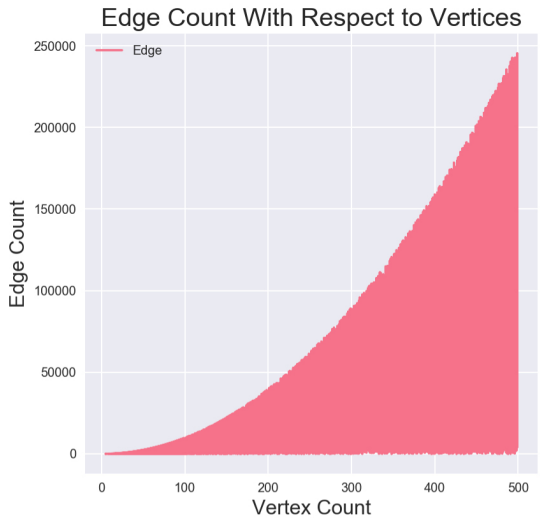


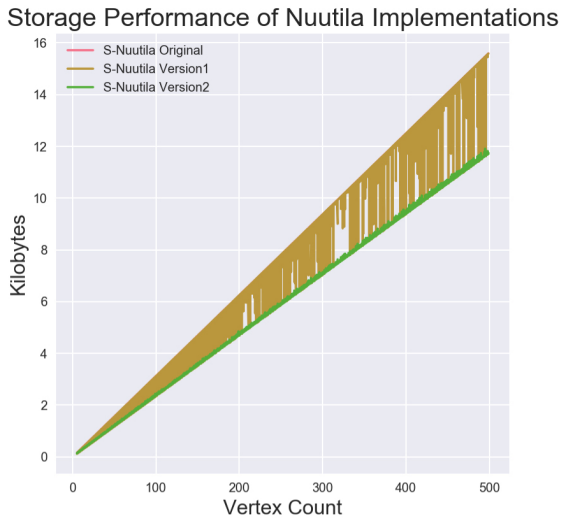


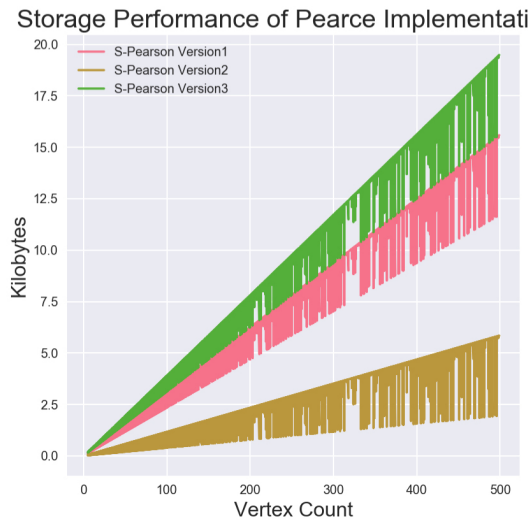


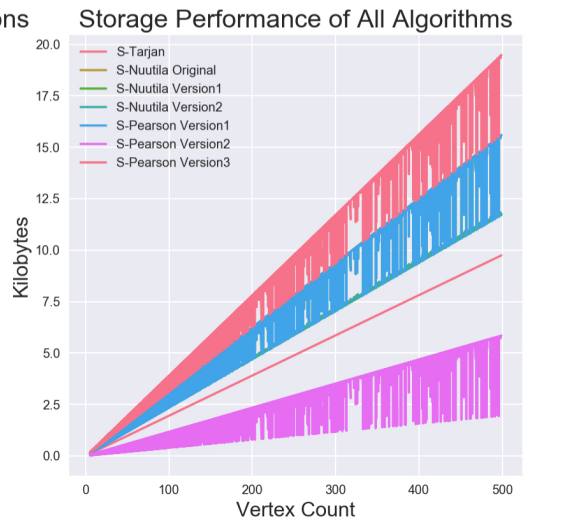


Analysis result of the first 75000 Graphs

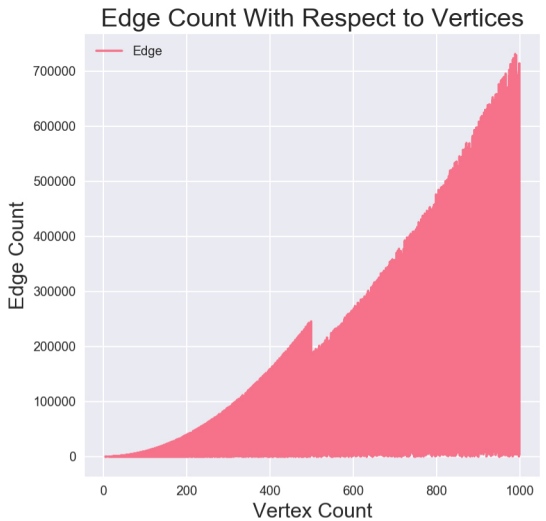


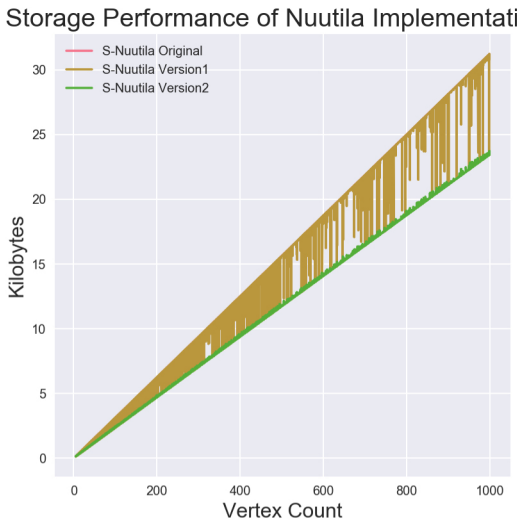


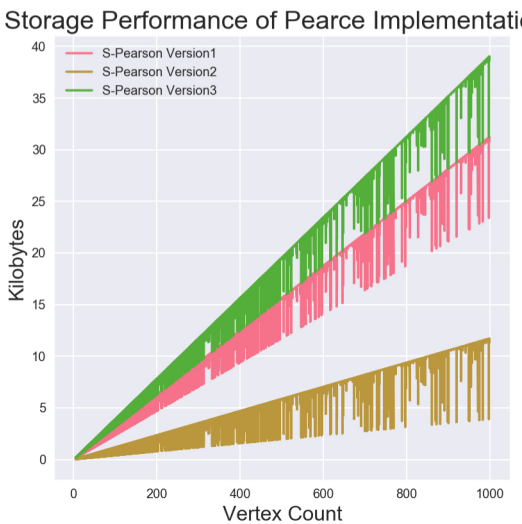


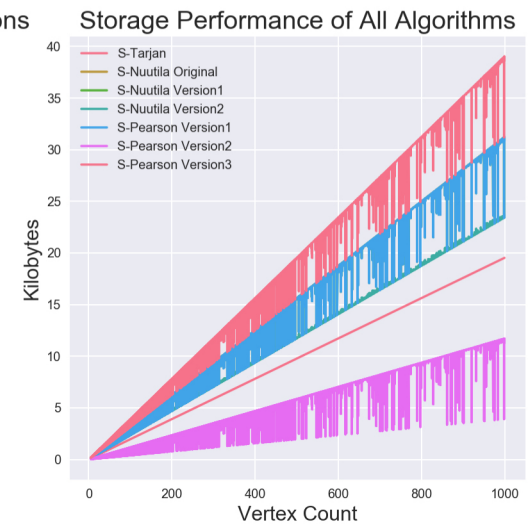


Analysis result of all of the Graphs









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- For Pearce algorithms, Version 2 Uses the least amount of storage.
- Among all the algorithms, Pearce Version 2 uses the least amount of storage .

Demo ?