Implementation of Several Influence Maximization Algorithm

Group 1
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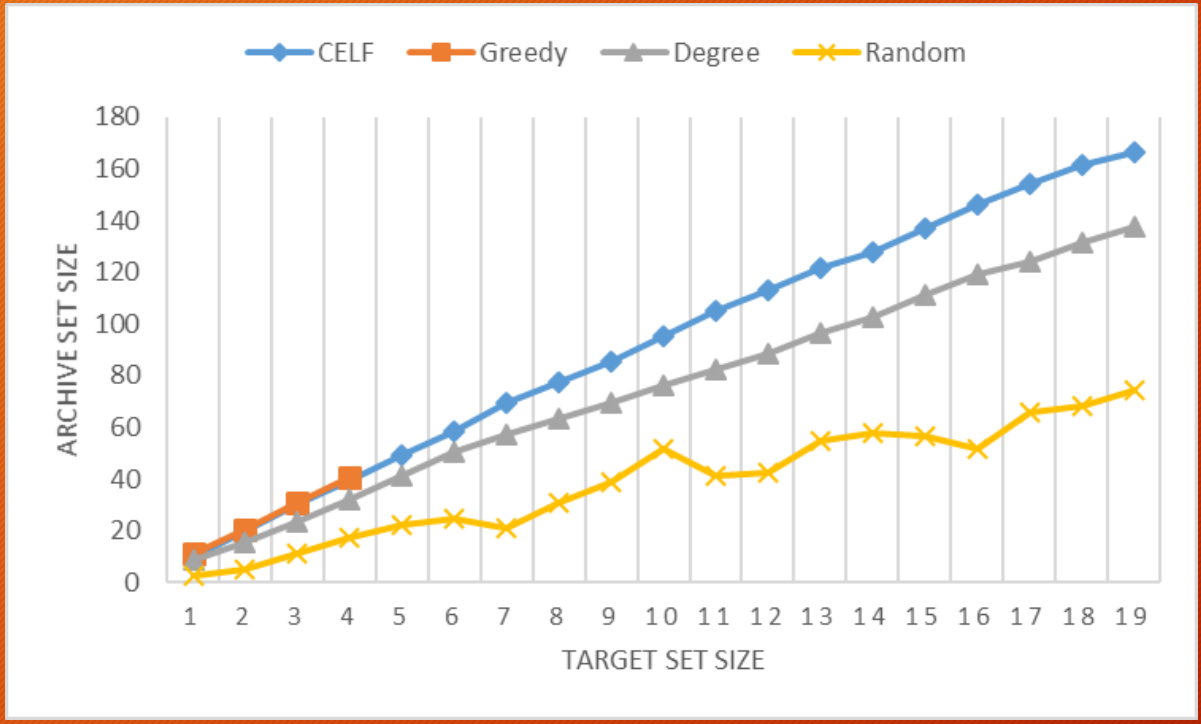
Outline

- Algorithm
  - CELF
  - Greedy
  - Degree
  - Random
- Dataset
  - Amazon
  - DBLP

Implementation

- Implemented by raw python (without any packages about network analysis).
- Since there is no weight provided in dataset, weight is generated randomly by random.rand() * 0.5.
- Use independent cascade model to calculate influence. For graph g and a given set of nodes A, we run IC(g, A) 100 times and take the average.

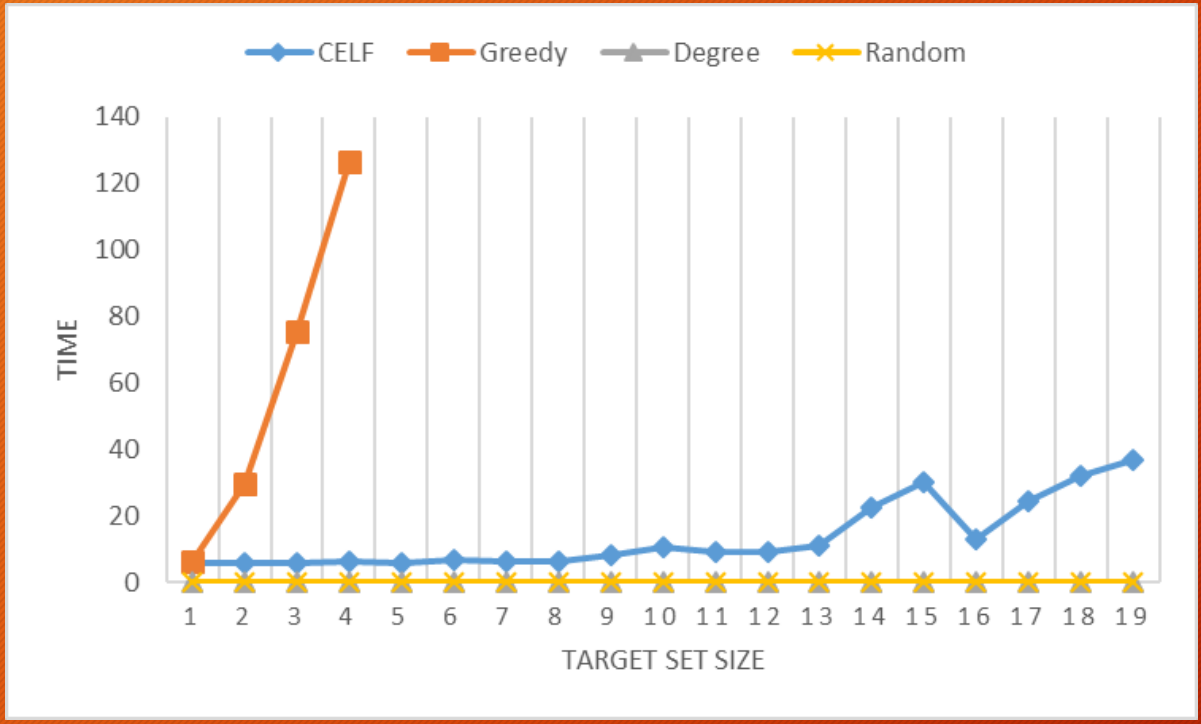
Influence on Amazon dataset



Analysis:

- CELF acts almost identical to greedy algorithm, better than degree algorithm. Random algorithm acts worse.
- Since greedy algorithm is too time-consuming, we only calculate target set size k=1,2,3,4 in this experiment.

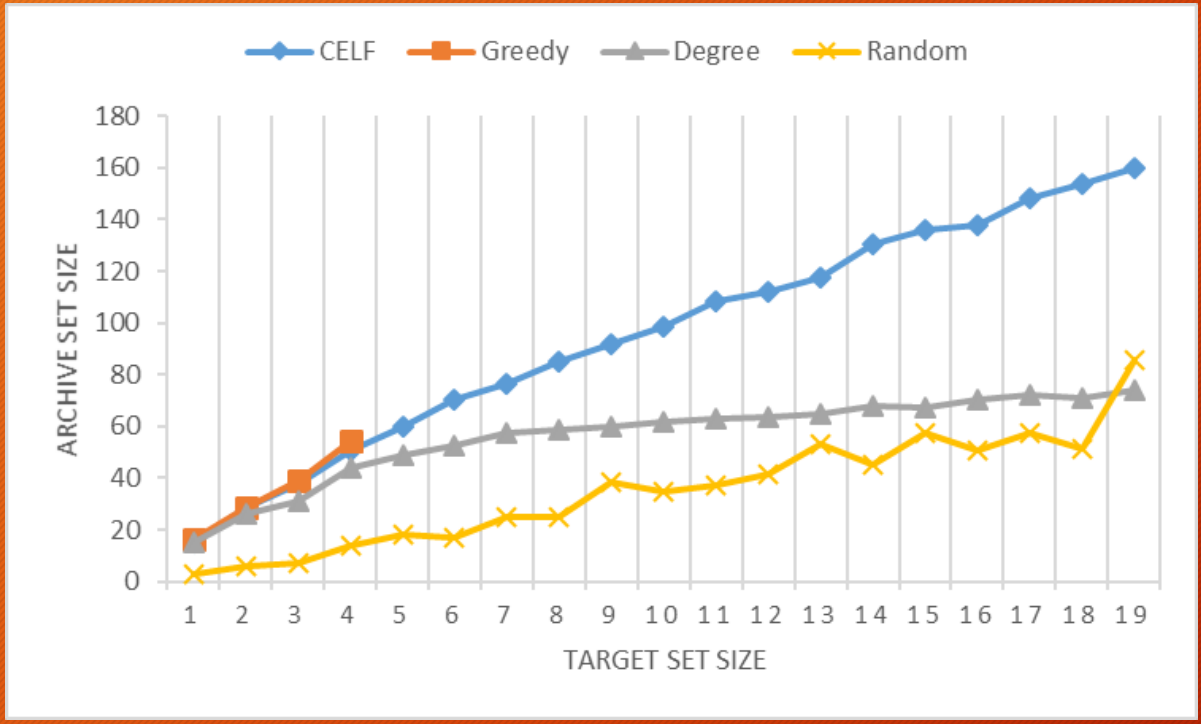
Time consuming on Amazon dataset



Analysis:

- Greedy algorithm is too time-consuming. CELF is much faster than greedy algorighm with almost identical result.
- Degree & random algorithm is very fast.

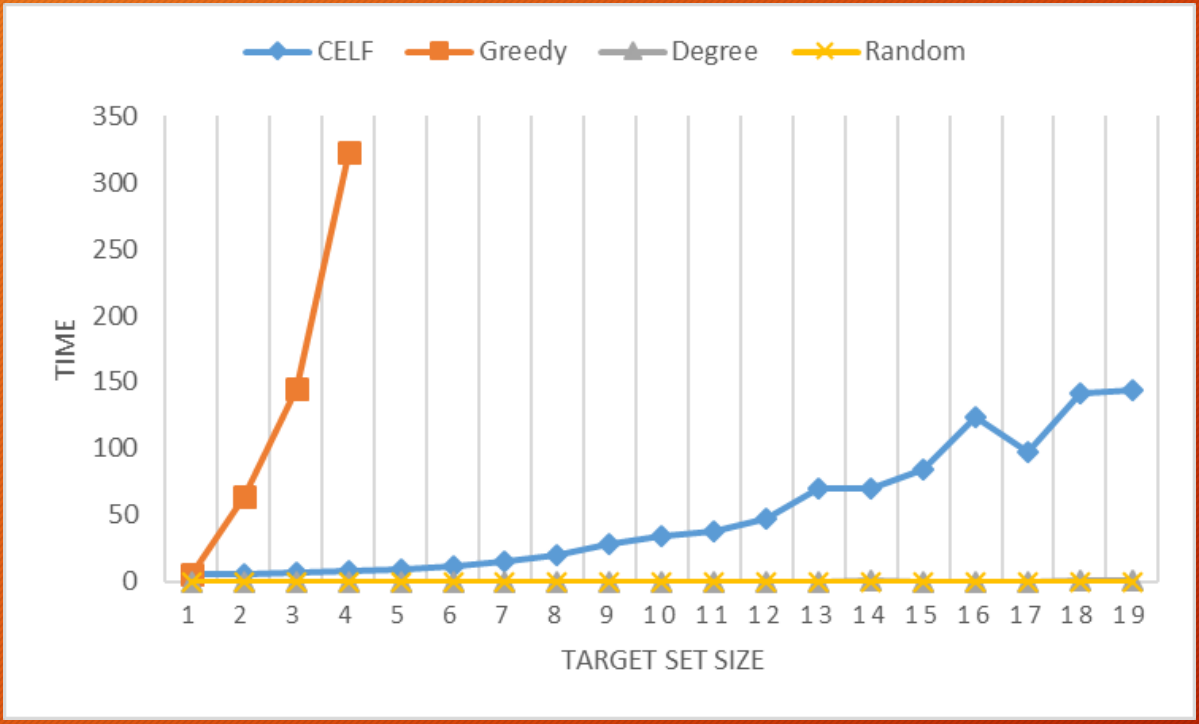
Influence on DBLP dataset



Analysis:

- The result is similar to Amazon dataset.

Time consuming on DBLP dataset



Analysis:

- The result is similar to Amazon dataset.

Code & Slide

- https://github.com/snowkylin/complex_network_course/tree/master/Homework_4

Thank you!

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