Assignment 1 – Task B

Focus on Task B this week.

- Discuss aims of task B.
- Discuss experiment setup and scenarios for task B.
- Discuss report structure.

Task B Aims

- Empirically evaluate the graph representations and your implementions for the described scenarios.
- Experience with explaining observed results to what you understand of the representations and implementations.
- Communicate about it.

Task B Experiments Setup

- Start with provided association graph or your own randomly generated graph of certain size.
- 3 Scenarios:
  - Removals
  - k-nearest Neighbours
  - Update edge weights
- We want to experiment how density of the graph affects the results (L, M, H).

Task B Experiments Generation - Density

- Start with provided association graph.
- To vary the density, you would need to add/remove edges to the facebook graph to the required density.
- Three settings - Low, medium and high density.
- For each setting, generate a number of datasets.

Task B Experiments Generation - Removals

- Start with a graph with tested density.
- Generate vertex removals, uniformly generating vertex labels from existing labels in the graph.
- Generate, remove from graph and time how long it took. Do this over a large number of removals, then take the average.
- Repeat for other datasets of same density.
- Repeat for edge removals.

Task B Experiments Generation - k-nearest neighbours

- Start with a graph with tested density.
- Generate vertex to do nearest neighbour, and compute and time.
- Vary in/out and different k's.
- Average across a number of nearest neighbour computations.

Task B Experiments Generation - Weight updates

- Start with a graph with tested density.
- Generate random edges to update weights. Randomly generate weights.
- Generate update operations and time how long it took. Do this over a large number of updates, then take the average.
- Repeat for other datasets of same density.

Task B – Report Structure

General structure:

- Data Generation and Experimental Setup:
    - experimental setup
    - how scenarios are geneated
    - how you measured the timing results
    - described how you generated the data labels to add, remove and compute neighbours/shortest paths.
- Evaluation:
    - Analyse, compare and discuss your results across different densities, representations and scenarios.
    - Explain why you think the results are as you observed.
    - Can compare with theoretical analysis.
- Summary: What you recommend for different scenarios, densities etc.

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Hint: Use tables, plots, bar charts, to summaries your results.

Extra Comments

- For printVertices(PrintWriter os) and printEdges(...), use the PrintWriter. E.g. os.print(...);
- For the arrays, I suggest to dynamically resize, as we don't know maximum sizes.