Friday, 20 April 2018

LAB DEMO 10

THE LAST ONE

PE Debrief (1)

- Average ?.??, Standard Deviation: ?.??
  - Max: Full 12 points, ?? students :O
  - Good job overall ☺
- Task A/C solution
  - Bla bla ☺

PE Debrief (2)

- Task B/D
  - Bla bla
- Plagiarism check status (should be near 0) as we enforce exam setting…

PS5 Debrief

PS5

- It is about Single-Source Shortest Paths++

PS5 Debrief – Common Mistakes (1)

Typical common mistakes in PS5:

- Mostly AC in A or B, but usually with struggle (WAs/TLEs)
- This time, each Subtask requires a different code :O

PS5 Debrief – Our Answer (1)

The ultimate solution for PS5 Subtask A:

- Run SSSP on Tree (DFS or BFS), Precalculate

The ultimate solution for PS5 Subtask B:

- Just copy paste DijkstraDemo code (as shown in class on Lecture 11a), Precalculate
- Other ways exists, “SPFA” algorithm??
  - Shortest Path *Faster* Algorithm
    - The term “Faster” is really misleading though ☹, reason only discussed in CS3233
    - Read CP3.17b, google, or read past exam paper about this extra SSSP algorithm :O

PS5 Debrief – Our Answer (2)

The ultimate solution for PS5 Subtask C:

- **Proper graph modeling!**
- Blow up each vertex **v** to **(v, vertices_used_so_far)**
  - This way, we can keep track of how many vertices used in the shortest path from source s to this vertex v
- Then modify your Dijkstra's implementation accordingly
  - **This is the hard part though…**
  - Wrong implementation can causes various WAs or TLEs
  - Common error: Forget to break when u == t, Break instead of continue when k_used > K, Order priority wrongly (should be distance, # vertices used, vertex number)
  - Lab TA will give closure if you fail to solve this by deadline

Is that a DP Problem?

Yes, we can classify PS5 Subtask C as a DP problem

This is because the transformed graph is actually a DAG

In fact, after you properly learn DP in CS3230, you may want to re-do this problem with DP technique instead of using Dijkstra's algorithm

- But it is 'slower' due to the usage of recursive calls…

Looking Back and Looking Forward

- Learnt many data structures and some algorithms.
- Hopefully enjoyed problem solving and the algorithmic portion of computer science
- All this (+Kattis) is often helpful in interviews, so please build up on this skill
- Maybe go on to take CS3230 or CS3233 (Steven flagship module)

- PS - Please provide me constructive feedback either in the NUS Feedback form or my github page :)

That’s all, Let’s take Class Photo!

All the best for your Final Assessment in ~3 weeks time (yeah, Thursday, 10 May 2018 is still a long time from this last class)

Lab TA will then post this photo in FB group for momento