

CS2040C Semester 1 2021/2022
Data Structures and Algorithms

Tutorial 11 - Finale
For Week 13

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1 Introduction and Objective

This tutorial/lab slot on Week 13 is set to wrap up the class and as an open slot for past paper discussions.

We will also do a quick class photo taking session (turn on your webcam or smile onsite) :).

The second half of the slot is to run VisuAlgo Online Quiz (the details will be communicated separately).

2 Standard Stuffs

Now, we complete our discussion of Dijkstra's algorithm. There are two versions:

1. The original version of Dijkstra's algorithm (as defined by Dijkstra himself and implemented using C++ STL `std::set` or Java `TreeSet` – a 'special' Priority Queue ADT that is still C++ STL/Java API-based that can be used to update/decrease key efficiently), and
2. The Modified Dijkstra's algorithm (using Lazy Update technique so that we can use built-in C++ STL `std::priority_queue`, Java `PriorityQueue`, or even Python `heapq`).

You should have also seen the SSSP on Tree, and SSSP on DAG (pre-cursor to DP), that are discussed during Lecture 12a.

So, let's do a short recap on this.

3 Past Paper Discussions, Open Ended

Here is the list of final paper questions that Steven found 'interesting' and 'suitable' for CS2040C final paper on Saturday, 27 Nov 2021, 1-3pm SGT. However, since they have been asked in the past,

obviously none of them can ever appear in the real final paper this semester. Perhaps TA can just throw a vote and discuss the most voted question first, and then repeat this process until either time (maximum 1 hour, as we need the 2nd hour for VisuAlgo Online Quiz) runs out (more likely) or all proposed problems below have been discussed (less likely).

1. <https://www.comp.nus.edu.sg/~stevenha/cs2040c/tests/CS2010-2015-16-S1-WQ2-medium.pdf>, Question C.1, Graph Traversal
2. <https://www.comp.nus.edu.sg/~stevenha/cs2040c/tests/CS1020E-2016-17-S1-final.pdf>, Question B.1, Printing Integers
3. <https://www.comp.nus.edu.sg/~stevenha/cs2040c/tests/CS2040C-2018-19-S2-final.pdf>, Question B.2, Interesting Variants
4. <https://www.comp.nus.edu.sg/~stevenha/cs2040c/tests/CS2040C-2017-18-S1-final.pdf>, Question C.1, Isomorphic BSTs
5. <https://www.comp.nus.edu.sg/~stevenha/cs2040c/tests/CS2040C-2018-19-S1-final.pdf>, Question C.3, From Matching to Connectivity

4 Class Photo

Let's take a class photo with your tutor as momento (and post the photos in Discord).

All the best for your final assessment of this module and of your other modules (PS: If you have not cleared PS5 (legally), you have to do so by end of tutorial/lab of Week 13).

5 VisuAlgo Online Quiz (10%)

This session will be done in the second half of the last lab session. All technical details (on this easiest component of the module) will be communicated separately.