

Thursday, 5 October 2017

LAB DEMO 05

Demo1: Graph DS Conversion

By now, you have seen at least 3 graph data structures:

1. Adjacency Matrix (AM), Lecture 05
2. Adjacency List (AL), Lecture 05
3. Edge List (EL), Lecture 05

Each DS is **strong in certain areas** but *weak in another*

- Sometimes we need to convert one DS to another

With 3 different graph DS, there are 6 conversion possibilities: **AM to AL**, AM to EL, AL to AM, AL to EL, EL to AM, and EL to AL

Demo1: AM to EL

Today, I will give you a **live demo** on conversion between two graph DS: AM to EL

At home, think of the other possibilities that we have not discussed yet

- Don't only start thinking about this during WQ2 or Final Exam ...

Demo2: Graph Traversal Example

By now, you have seen 2 graph traversal algorithms:

1. Breadth-First Search (BFS), Lecture 06
2. Depth-First Search (DFS), Lecture 06

Both runs in $O(V+E)$

Most of the time, both are equally good

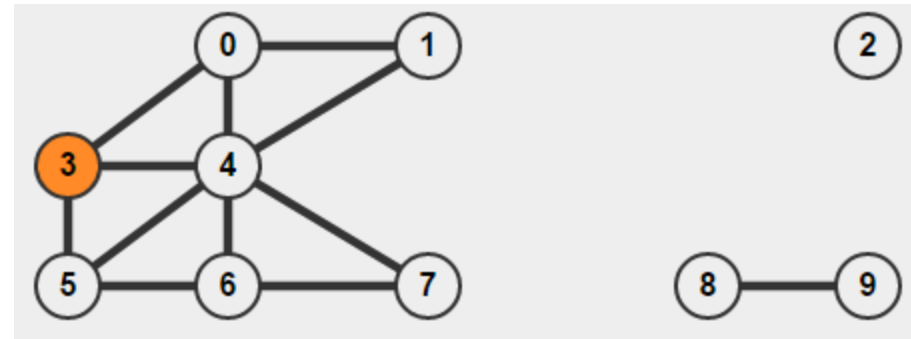
- Sometimes one is slightly better than the other

You may use it for PS3

Demo2: FloodFill 😊

Today, I will give you another live demo on finding connected components of a *grid-based* graph

LLLLLLLLLL		LLLLLLLLLL
LLWWLLWLL		LL..LLWLL
LWLLLLLLLL		L..LLLLLL
LWWLWWLL		L...L..LL
LLLWWLWLL	→	LLL...LLL
LLLLLLLLLL		LLLLLLLLLL
LLLWWLLWL		LLLWWLLWL
LLWLWLLLLL		LLWLWLLLLL
LLLLLLLLLL		LLLLLLLLLL



We link two 'W' cells with an edge if they share a common border (to 8 directions)

Other parts of the graph are not shown

PS3 Status (as of 6 Oct, 9am)

Name	A	B	C	D (ignored)
?	AC	AC	AC	Ignored
?	AC	AC		
?	AC			
The rest of you...				

1 more day to complete the relatively easier PS3

PS3 Subtask B+C Discussion

How to identify an important room on general graph?

- PS3 Subtask A has been discussed in tutorial

Have we learned an algorithm to check graph connectivity in Lecture 06?

But, can we use just use UFDS from Lecture 05?

What is the major difference between Subtask B and Subtask C?

PS3 Subtask D

PS3 Subtask D was previously a CS2010R problem, but now it is “no longer that challenging”

It is left behind for fun 😊

That's all for today

Lab TA will stay back for PS3-related questions, if any