Thursday, 14 September 2017

LAB DEMO 03

UFDS & Graph DS Review

- VA: https://visualgo.net/en/ufds
- Code: ch2_08_unionfind_ds.java from CP3 book: http://cpbook.net/#downloads

- VA: https://visualgo.net/en/graphds
- Code: ch2_07_graph_ds.java from CP3 book: http://cpbook.net/#downloads

VisuAlgo Online Quiz Next Week!

Remember: We will have VisuAlgo Online Quiz next week, during the lab session itself *(just to prove that you are the one doing the quiz, not someone else)*

Online Quiz 1 covers Binary Heap, BST, AVL Tree, including Lecture 05 stuffs: *Union Find Disjoint Sets and Graph Data Structures*

Man versus Machine (1)

How to ace VisuAlgo Online Quiz?

Answer: Simple, **practice like crazy**

- VisuAlgo Online Quiz is just a collection of (PHP) scripts at the server side and (JS) scripts at the client side
  - Unless some (hard) questions are hidden in training mode and only show it during Online Quiz, changes can't be made easily to questions that are already in the system
  - After enough # of trainings, you will start seeing similar question types*, just with random^ parameters…

Man versus Machine (2)

Some questions have shortcuts…

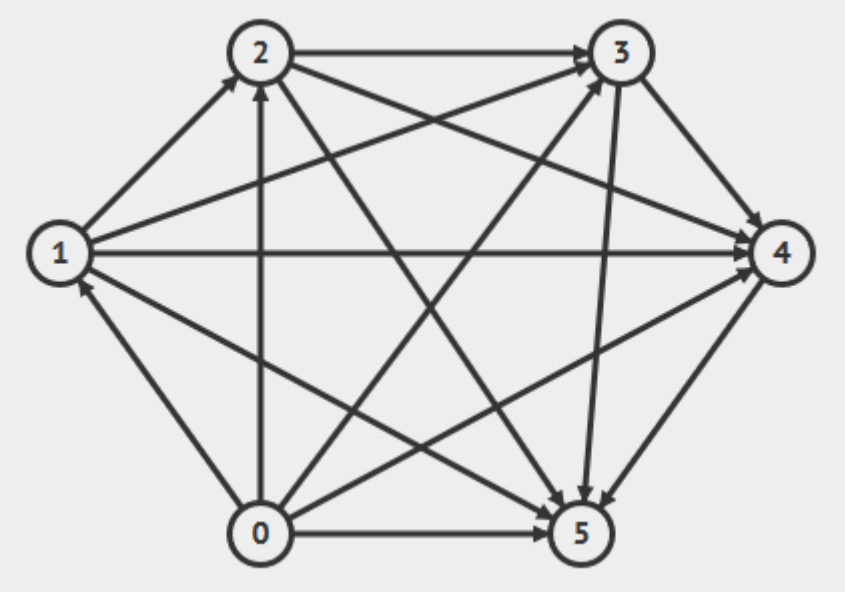
- Example 1: Perform ExtractMax() **k** times from Binary Max Heap of **n** elements, click all elements that are left behind?
  - Naïve: Perform ExtractMax **k** times, click elements that are left behind
  - Clever: Click **n-k** smallest elements in that Binary max Heap :O…
- Example 2: How many structurally different BSTs can you form with <a randomized small number> distinct elements?
  - Woah, what kind of question is this?
  - It is from Written Quiz 1 in S1 AY 2014/2015
  - Super hard if you don't know what to do, but very easy otherwise
  - The answer is …

Man versus Machine (3)

- Example 3: What is the minimum number of vertices in an AVL tree of <a randomized small number> height?
  - Another question that is solvable by using a formula
  - Hint: an AVL tree of height **h** requires two subtrees of heights **h-1** and **h-2**
- Example 4: Given **n** disjoint sets in a UFDS, can you get a single tree of height **h**?
  - How do you get a set to increase its rank?
  - 1 set of rank **h** requires 2 sets of rank **h-1** requires 4 sets of rank **h-2** requires…

Man versus Machine (4)

- Example 5: Draw a DAG with **V** vertices and **E** edges
  - How to keep drawing neat when **E** is large?
  - Draw a regular polygon, only draw edges from smaller vertex to larger vertex
  - Eg for **V** = 6, **E** = 15 (maximum number of edges)



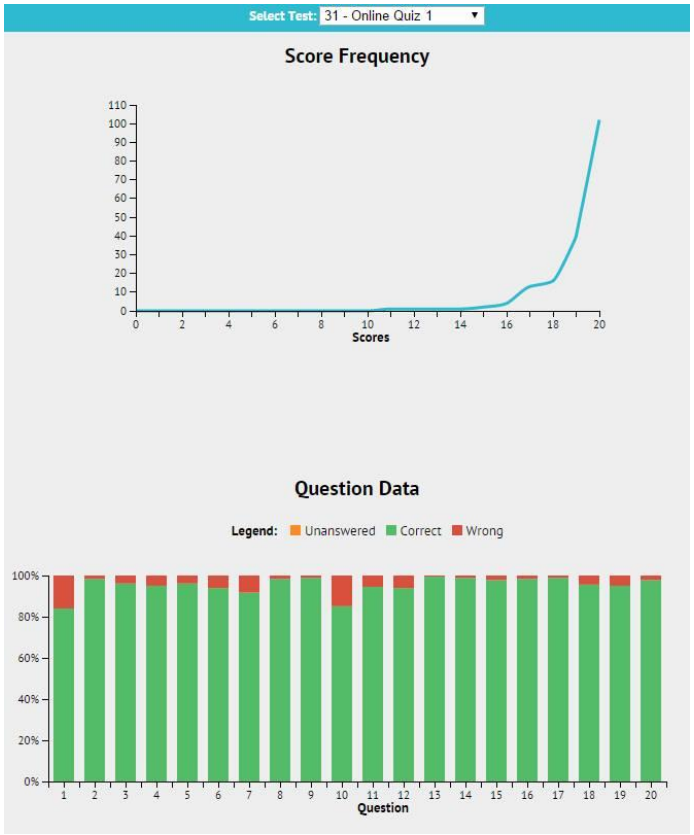
Show Off

Let's try the training mode of CS2010 OQ1 topics

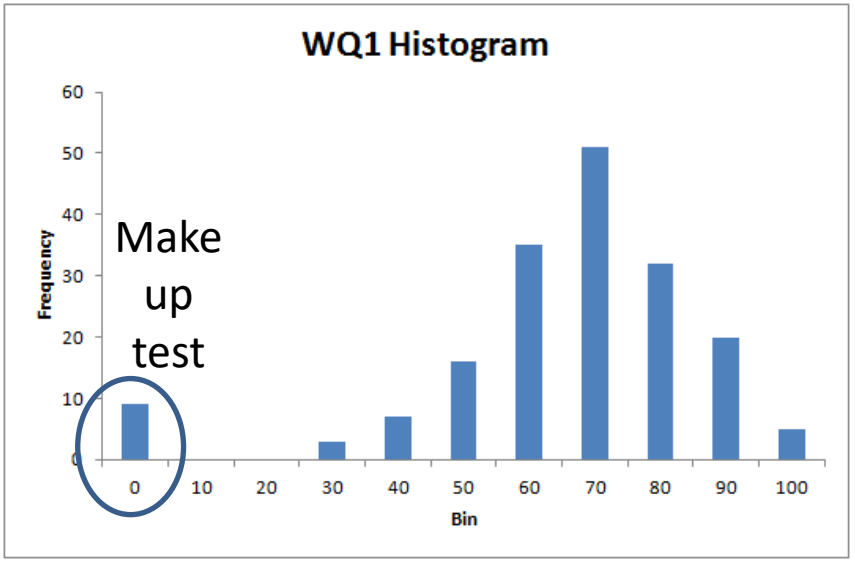
- Lab TA will do one round of show off to motivate you all to do the same thing in the next one week so that your basic understanding of these topics are top notch ☺
- Watch and analyze him/her as he/she do a speed run (20 hard questions in only 10 minutes)

Last Year's Online & Written Quiz 1

Machine



Man



PS2 Status (as of 12pm today)

Name	A	B	C	D
Group A	AC	AC	AC	1
Group B	AC	AC	-	
Group C	AC	6		
Group D	2			
Group E: have not tried	The rest			

About 1 more week to go before PS2 is due

Lab TA will stay back if you have lingering questions about PS2