# CS 561, HW5

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*Due: Nov. 17th*

1. Exercise 17.2-3 (Counter with reset)

2. Exercise 17.3-2 ("Redo Exercise 17.1-3..." Potential method, when i-th operation is a power of 2)

3. Exercise 17.3-7 (Insert and Delete-Larger-Half)

4. Problem 17-2 (Making Binary Search Dynamic)

5. Exercise 21.3-3 ("Give a sequence of m Make-Set, Union and Find-Set operations")

6. Exercise 22.2-6 / 22.2-7 ("There are two types of professional wrestlers")

7. Problem 22-4 (Reachability) [1]

8. Assume you are given a connected graph $G$. Give an algorithm that returns a vertex $v$ in $G$, such that if $v$ is removed, $G$ is still connected. Motivation: $G$ might represent a social network at a company and you want to choose some unlucky person to fire whose removal will not disconnect the company network.

9. Exercise 23.1-2 ("Professor Sabatier conjectures")

10. Exercise 23.1-3 ("Show that if an edge (u,v) is contained in some minimum spanning tree")

11. Exercise 23.1-4 ("Give a simple example of a connected graph such that the set of edges ...")

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[1]The answer to this problem can be used in an efficient randomized algorithm for estimating the *number* of vertices that are reachable - we may see this later in this class.