

# CS 561, HW5

Prof. Jared Saia, University of New Mexico

*Due: Nov. 16th*

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) <sup>1</sup>
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 ...”)

---

<sup>1</sup>We’ll see later in this class how your answer to this problem can be used in an efficient randomized algorithm for estimating the \*number\* of vertices that are reachable.