University of Nevada, Las Vegas Computer Science 477/677 Spring 2020
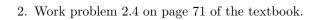## Assignment 1: Due Tuesday January 28, 2020

Name:_____

You are permitted to work in groups, get help from others, read books, and use the internet. But the handwriting on this document must be your own. Print out the document, staple, and fill in the answers. You may attach extra sheets. Turn in the pages to the graduate assistant at the beginning of class, August 14.

1. Work problem 2.5 on page 71 of the texctbook. Do not replace any transcendental constant with a decimal. For example "$\log_2 3$" should be left as is, but "$\log_2 4$" should be written as 2.

   (a) $T(n) = 2T(n/3) + 1$

   (b) $T(n) = 5T(n/4) + n$

   (c) $T(n) = 7T(n/7) + n$

   (d) $T(n) = 9T(n/3) + n^2$

   (e) $T(n) = 8T(n/2) + n^3$

   (f) $T(n) = 49T(n/25) + n^{3/2} \log n$

   (g) $T(n) = T(n-1) + 2$

   (h) $T(n) = T(n-1) + n^c$ where $c \geq 1$ is a constant.

   (i) $T(n) = T(n-1) + c^n$ where $c > 1$ is a constant.

   (j) $T(n) = 2T(n-1) + 1$ Work this one my substitution. Let $n = \log_2 m$, and let $F(m) = T(2^n)$. Substituting, we have $F(m) = 2F(m/2) + 1$.

   (k) $T(n) = T(\sqrt{n}) + 1$ Use substitution: $m = \log_2 n$.

2. Work problem 2.4 on page 71 of the textbook.

3. Problem 2.12 on page 23 of the textbook.