

University of Nevada, Las Vegas Computer Science 477/677 Fall 2015

Assignment 9: Due November 17, 2015

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. You may attach extra sheets, using a stapler.

1. Let A be an array of size n of numbers, and let L be a given number.
 - (a) Write pseudocode for an algorithm which computes the number of entries of A which are less than L .
 - (b) Your pseudocode will contain a loop. Write the loop invariant for that loop.
 - (c) What is the time complexity of your algorithm?

2. Let B be an ordered array of size n of numbers, that is $B[0] \leq B[1] \leq \dots \leq B[n - 1]$, and let L be a given number.
- (a) Write pseudocode for an algorithm which computes the number of entries of B which are less than L .
 - (b) Your pseudocode will contain a loop. Write the loop invariant for that loop.
 - (c) What is the time complexity of your algorithm?

4. This is an instance of the *stable marriage problem*. Unexpectedly, a set of seven rookies becomes available, and three teams are allowed to draft up to two rookies each. Each team has a list of rookies, in order of preference, while each rookie has a list of teams, also in order of preference. These lists are given below. Find a stable draft assignment. Which rookie is not drafted by any team?

Rookies' Preference Lists:

Bob	Tom	Sam	Dan	Hal	Ned	Ted
Rams	Rams	Bears	Rams	Rams	Bears	Saints
Bears	Saints	Rams	Bears	Saints	Rams	Rams
Saints	Bears	Saints	Saints	Bears	Saints	Bears

Teams' Preference Lists:

Rams	Saints	Bears
Bob	Bob	Sam
Hal	Tom	Hal
Tom	Hal	Bob
Ted	Sam	Tom
Dan	Ned	Dan
Ned	Ted	Ted
Sam	Dan	Ned