CSC 212: Data Structures and Abstractions

Spring 2018

University of Rhode Island

Weekly Problem Set #1

This assignment is due Wednesday 1/31 before lab. Please turn in neat, and organized, answers hand-written on standard-sized paper without any fringe. Problem set 1 is all about strings and arrays, these are fundamental data types. They are incredibly important to understand if you wish to be sucessful in this class!

1. Write a function that returns the length of a given string. For example, given `"Test"`, return `4`.
2. Using the function you defined above, create another function that returns true if a given string is a palindrome, and false if it is not. For example, `"ABCBA"` is a palindrome, `"ABC"` is not.
3. Define a function that returns the most frequently occuring character inside of a string. What would you have to change in order for this program to return the least frequently occuring character?
4. Write a function that returns the number of words in a given string.
5. Write a function that returns a missing number in an array of integers ranging from 1 to n. For example, given $[3, 2, 1, 5]$, ouput `4`.
6. Define a function that returns the average of the minimum and maximum elements in an unsorted array of integers. How would this code change if the array were sorted?

The following exercises are considered *optional*. You don't need to report answers on these.

1. Write a program that removes any duplicate integers from an array. For example, given $[1, 2, 2, 3, 4, 2, 5]$, the program should print $[1, 2, 3, 4, 5]$.
2. How would you implement a function that reverses a given array in place? Write a high-level psuedo-code for this function.
3. Briefly describe the difference between an array of integers and characters. How would you find their length? Space Requirements?