CSC 212: Data Structures and Abstractions
Spring 2018
University of Rhode Island
Weekly Problem Set #12

Due Thursday 4/26 before class. Please turn in neat, and organized, answers hand-written on standard-sized paper **without any fringe**. At the top of each sheet you hand in, please write your name, and ID. The only library you're allowed to use in your answers is `iostream`.

1 2-3 Trees

1. Draw a 2-3 tree after inserting the following elements: [10, 5, 12, 8, 19, 6, 2, 11, 15, 9, 7]
2. Write a search algorithm for a 2-3 tree.
3. True or False, while inserting nodes into a 2-3 tree, all required transformations are purely local. Explain your response.

2 Red-Black Trees

1. Draw a Red-Black tree after inserting the following elements: [1, 2, 3, 4, 5]
2. Draw another Red-Black tree after inserting the following elements: [23, 9, 5, 22, 7, 12, 28, 17, 20, 16]
3. Can Red-Black Trees be represented as 2-3 trees? If so, how?
4. Why is it advantageous to have balanced trees?
5. True or false, as you insert nodes into a Red-Black Tree, the height is strictly increasing?