CS 240: Data Structures and Data Management   **Fall 2020**

Tutorial 8: November 9

1.   Build a quadtree using the following points: (1, 4), (2, 5), (3, 2), (4, 7), (7, 3), (6, 1), (5, 6), (3, 7).

2.   Build a kd-tree using the following points: (1, 4), (2, 5), (3, 2), (4, 7), (7, 3), (6, 1), (5, 6), (3, 7). Note that these are the same points as the previous problem.

3.   Consider the following points being stored in a 2D range tree: $(2, 12)$, $(17, 77)$, $(23, 92)$, $(40, 47)$, $(55, 91)$, $(67, 27)$, $(89, 79)$, $(99, 53)$, $(10, 23)$, $(35, 7)$, $(61, 40)$, $(95, 56)$, $(22, 42)$, $(88, 15)$, $(42, 2)$.

a) Draw the x-BST for this range tree.

b) Draw the corresponding y-BSTs for the points $(88, 15)$, $(61, 40)$ and $(67, 27)$.

c) Perform a range-search with the query rectangle $[35, 88] \times [5, 30]$, indicating the boundary and allocation nodes.