CS2302 Data Structures
Spring 2020
Quiz 5

Open notes. You may request assistance from TA, IA, PL, teammate and instructor

1. The range of a node in a B-tree is the difference between the largest and the smallest items in the node. For example, the range of the root of the tree the figure is 0 (17-17=0), the range of the root's leftmost child is 5 and the range of the root's rightmost child is 4. Write the function *nodeRange(t)* that returns the range of BTreeNode t.
2. Write the function *countFullNodes(t)* that receives a reference to a B-tree and returns the number of nodes in the tree that are full. For example, if t is a reference to the B-tree in the figure, *countFullNodes(t)* should return 3.
3. Write the function *itemsAtDepthD(t,d)* that receives a reference to a B-tree and an integer d and returns the number of data items that are stored in the tree at depth d. For example, if t is a reference to the root of the tree in the figure *itemsAtDepthD(t,0)* should return [17], *itemsAtDepthD(t,1)* should return [6,11,23,27], and i*temsAtDepthD(t,3)* should return [].