

CS 14 - Summer 2003 - Quiz 3

July 22, 2003

1 True/False

Circle *T* or *F* as appropriate. Running-time questions are all in terms of input size n

1. **T F** Insertion into a 2-3 Tree has a running time of $O(n)$
2. **T F** Insertion into a heap has running time of $O(n)$
3. **T F** Heapsort has running time of $O(n \lg n)$
4. **T F** Heaps are most efficiently represented as pointer-based trees.
5. **T F** A 2-3 Tree has worse Big-O running time than a regular binary search tree.
6. **T F** A 2-3 Tree is a type of binary search tree
7. **T F** A Red-Black Tree is a type of binary search tree
8. **T F** The contents of a heap can be printed in sorted order in $O(n)$ time.

2 Short Answer

If you want the option to request a regrade available, your answers to these questions must be made in pen.

1. Describe in English a simple strategy for removing an element from a max-heap.

2. What is the running time for a method that returns the *size* of a heap and why?

3. Draw a heap containing the values 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

4. Draw the 2-3 Tree resulting from taking the empty tree and inserting the values 1, 2, 3, 4, 5, 6, 7, 8, 9, 10