## COS226 Group Activity

1. Binary heaps. from Spring 2008 Midterm, Question 5

Consider the following binary heap (i.e., the array-representation of a heap-ordered complete binary tree).

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - | Z | W | Y | T | G | K | V | R | S | F | A | - | - |

(a) Delete the maximum key. Give the resulting binary heap. Circle those values that changed.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - |  |  |  |  |  |  |  |  |  |  |  |  |  |

(b) Insert the key X into the original binary heap. Give the resulting binary heap. Circle those values that changed.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - |  |  |  |  |  |  |  |  |  |  |  |  |  |

2. Suppose you are given an input file with the keys C A H D J B F I E G.
(a) Draw the BST that results when you insert the keys in that order into an initially empty BST.
(b) Give the level order traversal of the BST.
3. Start with the BST drawn above.
(a) Draw the sequence of BSTs that result when you Hibbard delete G then D then H.
(b) Give the level order traversal of the resulting BST.
