You are required to write pseudo code to solve the following two problems related to binary search trees. In both cases, assume all nodes have VAL, LCHILD, RCHILD fields respectively denoting the (integer) value, left child pointer, and right child pointer. Your answer will be graded on correctness, efficiency, and readability (of the code).

**QUESTION 1 (10 points).** Suppose $T$ is a pointer to the root of a binary search tree, and suppose $k, v$ are arbitrary integers. Print out the $k$ values stored in the tree that are as far away from value $v$ as possible. You may assume that the distance between two values $v_1, v_2$ is given by $\text{abs}(v_1 - v_2)$. The order in which the answers are printed is significant - the most distant point from $v$ is printed out first, the second most distant point from $v$ is printed out next, and so on. If multiple values are at the same distance from $v$ those values can be printed out in any relative order.

**QUESTION 2 (10 points).** Suppose $T$ is a pointer to the root of a binary search tree, and suppose $v_1, v_2$ are arbitrary integers. Let us define the distance between $v$ and the pair $(v_1, v_2)$ to be $\max(\text{abs}(v_1 - v), \text{abs}(v_2 - v))$. Find a point $v$ in the tree that $T$ points to whose distance from a given pair of integers $v_1, v_2$ is as small as possible.