Group assignment of Capstone I

Deadline: 10/19/2016

1. (*Logic reasoning*)
   Justify the correctness of Huffman encoding algorithm: In Huffman encoding algorithm (sort the symbols in order and merge the top two symbols iteratively until only one node is left), prove that for two symbols A and B with probabilities p(A) >= p(B), then in the resultant representation sequence according to Huffman encoding procedure, the length of symbol A is no longer than that of symbol B.
2. (*Algorithm design and complexity analysis*)
   For a square N x N matrix A, assume the elements are sorted in ascending order along the horizontal and vertical directions already, i.e., $A[i][k] \leq A[j][k]$ and $A[k][i] \leq A[k][j]$, where i<j. Develop an efficient algorithm to search for the query value v from A, return the location if found, None otherwise. Analyze the time complexity of your algorithm.
3. (*Double-blind testing*)
   Use double-blind testing method to evaluate the performances of three search engines that you are free to choose.

Performance evaluations:

1. A mini-presentation of your answers during 10/19 class, graded by all other groups.
2. Made your solution folder available in your GIT repo on 10/19.