

## Problem 7

a) The main difference between Boyer-Moore and Knuth-Morris-Pratt is that the direction of compare in one guess. Knuth-Morris-Pratt perform a forward order, that is, for a guessing, it compares from beginning to end. Unlike KMP, Boyer-Moore perform a reverse order, that is, for a guessing, it compare form end to beginning. This difference is an advantage for Boyer-Moore because when we encounter a mismatching, we can judge whether the mismatched character in the Text is appeared in the pattern, or even not appeared in the pattern, then we can skip a lot of guesses easily using the position of the last occurrence of that character in the pattern.

b)

i) Let  $F[]$  be the failure array.

$$F[0] = 0, F[1] = 0, F[2] = 1, F[3] = 2, F[4] = 3, F[5] = 0, F[6] = 1$$

ii) Let  $L[]$  be the last occurrence array

$$L[A] = 6, L[K] = 3, L[M] = 5, L[R] = -1$$

iii) Let  $A^s[]$  be the suffix array

$$A^s[0] = 7, A^s[1] = 6, A^s[2] = 2, A^s[3] = 0, A^s[4] = 4, A^s[5] = 1 \\ A^s[6] = 3, A^s[7] = 5$$