

# COMP9319 Exercises

**Solution :** Please come to the consultations if you have questions with the answers below.

## Question 1

Suppose that the BWT encoded string  $BWT(T) = \text{arbbrraa\$}$

where  $\$$  is the last character of  $T$ .

Derive the number of matches for the search pattern **ar** using backward search.

Ans: 2 matches

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## Question 2

Suppose that the BWT encoded string  $BWT(T) = \text{ac\$cccaabbcab}$

where  $\$$  is the last character of  $T$ .

Derive the number of matches for the search pattern **abc** using backward search.

Ans: 2 matches

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## Question 3

Suppose that the BWT encoded string  $BWT(T) = \text{n\$rsocimpse}$

Derive the  $S$ ,  $B$ , and  $B'$  arrays after applying RLTM index on  $T$ .

Ans:  $S=\text{n\$rsocimpse}$   $B=111110111111$   $B'=11111101111$

## Question 4

Suppose that the RLTM encoded string of text  $T$  is **cgc\$agagatc** where  $\$$  is the last character of  $T$ . Its corresponding bit array  $B$  is **1101011101110011**.

Derive its  $B'$ .

Ans:  $B'=1111001101101011$

## Question 5

Suppose that the RLTM encoded string of text  $T$  is **cgc\$agagatc** where  $\$$  is the last character of  $T$ . Its corresponding bit array  $B$  is **1101011101110011**.

Derive the number of matches for the search pattern **cag** using backward search.

Ans: 2 matches

## Question 6

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Suppose that the RLFM encoded string of text T is `cgc$agagatc` where \$ is the last character of T. Its corresponding bit array B is 1101011101110011.

Derive the last 4 characters of T.

Ans: agcagcagactggac\$



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