Algorithmics - Tutorial Sheet 4

Strings and text algorithms

1. Construct the border table B for the KMP algorithm for the string:

   agcagacagcacg

   Solution: The border table is given by:

j	0	1	2	3	4	5	6	7	8	9	10	11	12
$B(j)$	0	0	0	0	1	2	1	0	1	2	3	4	0

2. Indicate precisely which character comparisons would be made if the Boyer-Moore algorithm were used to locate the first occurrence of the string $s = $ agcga in the text $t = $ agcgcctgatagcgacagt.

   Solution: The following outlines the character comparisons performed by the Boyer-Moore algorithm.

   ```
   agcgcctgatagcgacagt
   agcga
   ```

   1 comparison (c appears in string so move along so c's line up)

   ```
   agcgcctgatagcgacagt
     agcga
   ```

   1 comparisions (t does not appears in string so move along by the length of the string)

   ```
   agcgcctgatagcgacagt
          agcga
   ```

   1 comparison (g appears in string so move along so g's line up)

   ```
   agcgcctgatagcgacagt
            agcga
   ```

   1 comparison (c appears in string so move along so c's line up)

   ```
   agcgcctgatagcgacagt
              agcga
   ```

   5 comparisons (string has been found) 9 comparisons in total.