

## Tutorial 9: July 20

1. Let  $P = \text{abacabaca}$  and let  $T = \text{abacabacdabaca}$ . Search for  $P$  in  $T$  using the KMP algorithm.
2. Consider using the Boyer-Moore algorithm with only the Bad Character heuristic to search for a pattern  $P$  of length  $m$  in a text  $T$  of length  $n$ , with  $n > m$ , where  $P$  does **not** appear in  $T$ .
  - a) Give an example of a pattern  $P$  with length  $n$  and text  $T$  with length  $n$  that achieves the worst-case runtime for searching. Do not consider preprocessing time.
  - b) Same question, but for the best-case runtime.
3. Let  $s$  be a string of length  $n$  and let  $\mathcal{T}_s$  denote the corresponding suffix tree. For an integer parameter  $1 \leq \ell \leq n$ , give an  $O(n)$  time algorithm that finds the most commonly occurring substring of length  $\ell$  in  $s$ .