University of Waterloo
CS240E, Winter 2023
Assignment 5 Post-Mortem

Question 1

- in Q1b, many solutions mentioned the loose (but sufficient) lower bound of $(n+1)$ on the number of leaves. In fact, there could be up to $(2n+1)$ outcomes:

  - p_1 has x-coord a
  - $\vdots$
  - p_n has x-coord a
  - p_1 has y-coord a
  - $\vdots$
  - p_n has y-coord a
  - none of $p_1, \ldots, p_n$ have x- or y-coord a

- in Q1c, many solutions claimed that we can reduce search to partial match without actually giving the reduction.

Question 2

- This question was generally done well.

Question 3

Q3 was done very well but

- many students just found a deepest internal node without justification

- many solutions stated $|\Sigma| = 3$. In fact, the end-of-word character symbol is not part of the alphabet (see line 3915 in the notes)

- many solutions introduced unnecessary augmentations. Please make sure you understand the definition of a compressed trie.

- many solutions wrote unnecessarily complicated pseudocode. The main goal of pseudocode is to clearly convey the idea rather than to use unnecessary, language-specific syntax

- most explanations were correct, but errors in suffix tree terminology were fairly common. Again, it is important to review the definition of a compressed trie.

- many correctness arguments were unnecessarily long. It is important to be able to argue correctness concisely, especially in an exam setting. See solutions for a concise argument of correctness.

- many solutions referred to "the" internal node of greatest depth. Yes, the greatest depth is well-defined, but there might be more than one node that achieves this depth.

Question 4

- This question was generally done well.

Question 5

- some solutions made small errors in Q5a

- many solutions did not complete the base case in Q5c. To go down two steps in the inductive step, we need to prove the base case for both $i = 2$ and $i = 3$