

University of Waterloo
CS240 Winter 2025
Assignment 5 Post-Mortem

Question 1 [3+4+3=10 marks]

- This question was generally well done.
- Many students stated that the worst case running time of range search in the relaxed version of the range tree was $\Theta(n^2)$ instead of $\Theta(n)$ for part c.

Question 2 [4 marks]

- This question was well done.
- Some students provided a pattern that created false positives at every check but did not require the string comparison to check every character of the string. This is not the worst case.

Question 3 [4+4+2=10 marks]

- This question was well done.

Question 4 [3+6=9 marks]

- Some students incorrectly calculated their shift amounts for part b.
- Many students did not fully utilize the information from $N(c)$ to determine the best shifts in the future for part b. When shifting to the location in $L(c)$, the shift from $N(c)$ can be stored to potentially provide a better shift in the future.

Question 5 [2+3+5=10 marks]

- Some students did not include the string consisting of only the end of string character (\$) in their suffix array in part a.
- Likewise, some students did not consider the existence of the end of string character for part b.
- Some students did not store additional information in their AVL-tree nodes (max/min value of subtree) for part c. This caused their range search to take worst case $O(n)$ time.

Question 6 [3+2=5 marks]

- This question was well done.
- Some students did not follow the tie-breaking rules given by the question when constructing their Huffman tree for part a.
- Many students did not provided the coded text for part a.
- Some students argued that there could only be two leaves at the deepest level for part b.