University of Waterloo
CS240 Fall 2022
Assignment 4 Post-Mortem

This document goes over common errors and general student performance on the assignment questions. We put this together using feedback from the graders once they are done marking. It is meant to be used as a resource to understand what we look at while marking and some common areas where students can improve in.

Question 1   [3+3+3+3+2=14 marks]

- For part (a), the most common error was giving the wrong chaining order for the keys 20 and 10.

- For part (d), some students forgot to include the second table, which is required for Cuckoo Hashing.

- For part (e), students who got this question wrong forgot to mention one of two points: trying to insert 25 into the second table would not be possible, and there is the chance of an infinite loop occurring (see the solutions for the exact insertion order).

- Other miscellaneous errors were mostly centred around incorrect table values in parts (b), (c), and (d).

Question 2   [6+3+3=12 Marks]

- The most common error for part (a) was not representing the quadtree properly (either by using an incorrect ordering of children or providing incorrect leaf nodes).

- For parts (b) and (c), students were asked to provide the exact heights of the quadtrees – some erroneous answers included giving incorrect expressions for the height rather than the exact height itself.

Question 3   [5+5+5 = 15 Marks]

- Parts (a) and (b) were generally answered well, and while there were some isolated mistakes, there were no common errors.

- For part (c), the most frequent mistake was counting the number of associate $(y-)$ trees incorrectly – this in turn led to the incorrect answer.

Question 4   [8 Marks (Plus 5 Bonus Marks)]

- For part (a), many students who attempted this question did not specify the correct range constraints for their searching algorithm – some ranges were wrong, while others were not checked.

- For part (a), some answers that did not receive full credit did not provide sufficient justification for their runtime and space complexities.

- For part (b), students who did not receive full marks for this question presented a flawed strategy for running the search algorithm with $c = 4$ (either by providing an incorrect data structure to incorrect search parameters).