

**University of Waterloo**  
**CS240E, Winter 2021**  
**Assignment 2 Post Mortem**

**Question 1 [6 marks]**

- The most common error was choosing a radix which is a constant.
- Some students said that  $O(1)$  space was required.

**Question 2 [5 marks]**

- Generally well done. The most common mistake was assuming that the median could be accessed in constant time in the list, without first converting to an array.

**Question 3 [3+4=7 marks]**

- For a) some students just mentioned that decision trees can be used, similar to how they are used in sorting. But they never gave the details for this specific problem.
- For b) some students didn't give proper details of how the quickselect implementation would work.

**Question 4 [2+5=7 marks]**

- Some students missed the lower bound in a).
- For b) student defined two potential functions (one for each operation) instead of one for both operations.
- Students had trouble calculating or justifying what the potential before and after *insert* and *deleteMax* must have been.
- Some students said that the length of the new list was  $\log n$  instead of  $2 \log n$ .

**Question 5 [2+2+4=8 marks]**

- For a), some students there were arithmetic errors.
- For a) and b), students had trouble setting up the summations correctly (e.g. starting the geometric sum at 0 instead of 1).

- For c), many students did not write down the final solution as  $c \log(n) + d$ , but as  $\log_{4/3}(n) + d$ .
- For c), the value of the constant  $c$  was sometimes incorrect due to arithmetic errors.