DESIGN AND ANALYSIS OF ALGORITHMS — HT 2019
Problem Sheet 2

Answers for questions marked ∗.

Divide and Conquer, cont'd

Answer to question 2

For the standard method, the total number of arithmetic operations is $2 \times 800^3 - 800^2$ which is more than 10^9. For the hybrid method, the total number of arithmetc operations is $(18 \times 400^2) + (7 \times 18 \times 200^2) + (7^2 \times 18 \times 100^2) + (7^3 \times 18 \times 50^2) + (7^4 \times 18 \times 25^2) + (7^5 \times (2 \times 25^3 - 25^2))$ which is less than 6×10^8.

Heaps, heapsort and priority queues

Answer to question 7

$O(n \log n)$ in both cases. Doesn't matter whether we use a min-heap or a max-heap. The process of maintaining the heap structure via repeated Max- (or Min-) Heapifying still has to be carried out.