

1. Q — Explain why question #2 from Section 4.2.1 takes $O(n^3)$ steps, and question #3 takes $O(2^n)$ steps. This is mentioned in the text (with different wording, because the big-Oh notation is only introduced in the next section), but no detailed explanation is given. Do use the big-Oh notation in your explanation, at least in the conclusions.

A — For #2, the rough algorithm might be:

- 1) Pick n_1 : which can be done in n "passes" through the set S
- 2) Pick n_2 : which can be done in n "passes" through the rest of the set S
- 3) Pick n_3 : which can be done in n "passes" through the rest of the set S

Combined, these 3 series of operations can be performed in n^3 steps, hence the $O(n^3)$.

Similarly, since there are $2^{n-1} - 1$ *complementary pairs* of sets to test for question #3, A computer will have to loop $2^{n-1} - 1$ which is *no more than* 2^n times to determine the answer.