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Rectangle Area Problem

I am writing about my solution to computing the total area covered by two rectilinear rectangles. I wrote the code in python3. The runtime: 44 ms and memory usage: 12.8 MB were both better than 91% of submitted solutions in python3.

I did also submit a second solution with memory usage 12.7MB with 100% better memory use than other submissions. Futhermore, I note that a vectorized implementation reduces the runtime more.

I am, however, sticking to discussing the 44 ms and memory usage 12.8 MB solution because I believe it achieves a very good balance between code readability and robustness. As LeetCode is intended to help people learn, I believe a good solution should include plenty of comments, explanation of variables, and calculations should be comprehensible to a wide audience. While it is possible to improve memory and speed by combining calculations, it leads to an undesireable side effect of reducing code readability.

For the mathematics that go into the solution, I picked ideas that are known to high schoolers: the area of a rectangle is computed by calculating base times height. I explain how to check whether rectangles overlap and explain that one needs to subtract the overlapping area from the sum of the areas of the two rectangles to avoid double counting.

I keep the code simple and clean thereby making it easier for others to follow.