

2. Consider the problem Area-Union, that takes as input a set of axis-parallel rectangles and outputs the area of the union of these rectangles. A rectangle is axis-parallel if each side is parallel to the x -axis or y -axis. **Also assume that your input instance is such that any rectangle can intersect with at most one other rectangle.**
- (a) (5 points) Design a sweep line algorithm for Area-Union. [Hint: What should be the events of the sweep line? What area is covered between events?]
 - (b) (5 points) What is the running time of the algorithm? Explain your answer.