CS218 Assignment 1

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Length

Finding the length would proceed as follows:

- Sort the posters/trapeziums according to their first x-coordinate
- Now maintain a start point and end point(X-coordinate) of the first trapezium. If the base of next trapezium intersects with this current base (i.e if start[next] $\leq$ end) increment the end point to end[next].
- Else add to our length (initiated to 0)the quantity: end - start. Change the start and end point respectively to start[next] and end[next].

Area

To compute the area we will compute the outline of the region covered by the trapeziums which we have already sorted.
We will use divide an conquer approach for this. Divide the trapeziums into two halves and compute outlines of each of them recursively. Compute the merged outlines as follows:

- See which of the two outlines are above and add its points to the final outline. We check this by calculating y-coordinates of each outlines at every x-coordinates of the combined outline.
- Increment that outline index whose x coordinate is lagging.
- When we observe that one of the outline was below the other and then goes above then there must have been a intersection in the middle. Calculate that and add to merged outline

After calculating outline area is simple, we just add the areas of the sub-trapeziums formed by it.