Dear candidate,

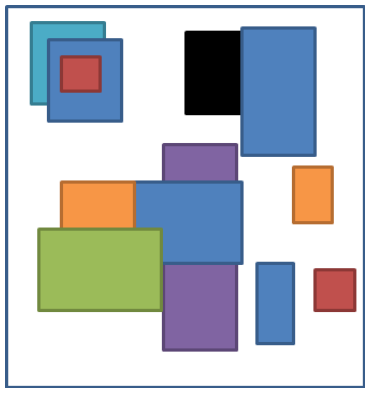
Following is a question that is a preparation for the interview at Moovit. The purpose of this question is both to shorten the interview time, and to act as a good filter for the interview, so as to not waste neither your time nor ours.

This exercise should take you somewhere between 30 minutes to an hour. Please perform this exercise yourself, as in the interview we will elaborate regarding it, and moreover, the interview itself will contain other more complex questions. For your success, make sure to read this document thoroughly (especially the note section) before beginning the exercise.

The Rectangles Store

The requirements of this exercise are for you to implement a class that stores rectangles. A rectangle is defined by the following interface:

```
public interface IRectangle {
    int getLeft();
    int getTop();
    int getRight();
    int getBottom();
    Properties getProperties();
}
```



During its initialization process, your store will receive a rectangle that represents its bounds (e.g. the area in which other rectangles can appear), and a collection of rectangles. A visual representation of this can be seen at the right.

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You are required to store these rectangles in an efficient manner (in terms of memory consumption), and to later return the topmost rectangle (topmost being defined as the input list's z-index) per specified x, y location (or null in case no rectangle exists in the specified location) in the most efficient way possible in terms of performance.

Note: *Assume that the solution should support a large number of rectangles, and that the bounding rectangle can be extremely large, so a solution containing a simple collection of rectangles isn't efficient enough performance-wise, and a solution containing a map of each point to its corresponding rectangle isn't efficient enough memory-wise.*

The interface that you should implement is defined as:

```
public interface IRectanglesStore {
   void initialize (IRectangle bounds, Collection<IRectangle> rectangles);
   IRectangle findRectangleAt(int x, int y);
}
```

Good luck!

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