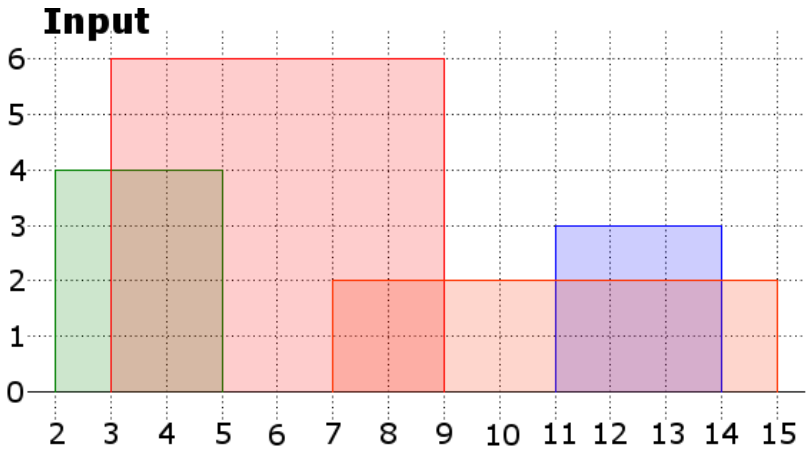
COS 485: Program #2 – Skyline

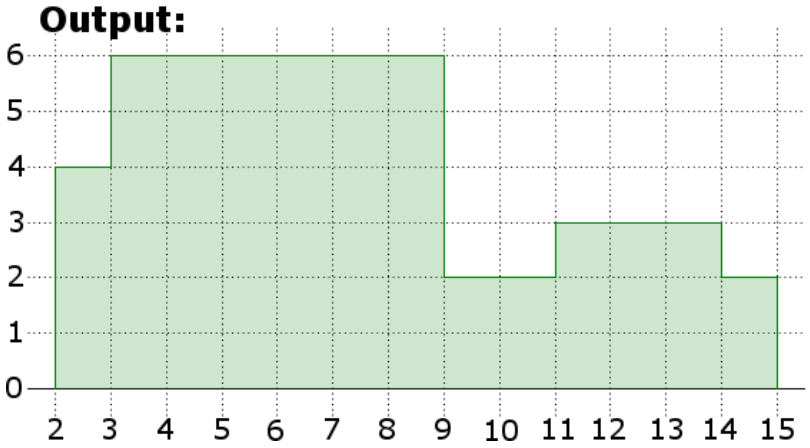
Objectives: Designing and coding a divide and conquer algorithm

For this problem the input is a list of N unordered rectangles representing the profiles of buildings. Each rectangle is specified with 2 coordinate pairs (x1, y1), (x2, y2) which specify the upper left and lower right corners of the rectangle respectively. All of the rectangles sit on the same base level and have y2 = 0. Some of the rectangles overlap, and your task is to merge all the rectangles into a single profile which is a list of coordinate pairs ordered from left to right specifying the new height at each point in the profile where the height changes.

Below is an example input file and its resulting skyline:



profile (2,4),(5,0)
profile (3,6),(9,0)
profile (11,3),(14,0)
profile (7,2),(15,0)



profile (2,4),(3,6),(9,2),
(11,3),(14,2),(15,0)

Design a divide and conquer algorithm to solve this problem. It will be similar to mergesort.

Setting up the project in Eclipse:
Create a new project similar to how you set up program 1:

- It will use SkylineTester.jar, the same Scaffold jar, and starting code Skyline.java
- In the run configuration set **Main class** to: tester/SkylineTester

What to turn in:
Written Report turned in through Brightspace (must be .doc, .docx, or .pdf)

1. A brief English description of your algorithm
2. An analysis of its worst case execution time
3. A screen shot of the report tab
4. A screen shot of your results for test5.txt

Electronic Submit

From a Unix machine in the lab run the program "submit" to submit your files.
Submit your source code (.java files) and compiled code (.class files) to the directory: **prog2**

Grading:

- 10 points – English explanation of your algorithm
- 10 points – clearly explained run time analysis
- 20 points – is a divide and conquer algorithm
- 60 points – full credit if correct on all test cases