Assignment 4

1. Assist an architect in drawing the skyline of a city given the locations of the buildings in the city. All buildings are rectangular in shape and they share a common bottom (a flat surface). A building is specified by an ordered triplet (L_i, R_i, H_i) where L_i and R_i are the left and right (x) coordinates, respectively, of the building i ($0 < L_i < R_i$) and H_i is the height of the building.

   - For example, the input can be as follows.
     $(33, 41, 5)$
     $(4, 9, 21)$
     $(30, 36, 9)$
     $(14, 18, 11)$
     $(2, 12, 14)$
     $(34, 43, 19)$
     $(23, 25, 8)$
     $(14, 21, 16)$
     $(32, 37, 12)$
     $(7, 16, 7)$
     $(24, 27, 10)$

   The pseudocode/program should give the minimum number of points on graph (coordinates) as output to assist the architect in drawing the skyline.

   1.1. (T) Write a pseudocode (using an incremental/conventional approach) to find the skyline. Analyze the time complexity.

   1.2. (L) Write a program using an incremental (conventional) approach to find the skyline.

   1.3. (T) Write a pseudocode to find the skyline using the divide and conquer approach. Analyze the time complexity.

   1.4. (L) Write a program using the divide-and-conquer approach to find the skyline.

2. Given two matrices A and B, answer the following questions.

   2.1. (T) Write a pseudocode (using an incremental/conventional approach) to multiply the given matrices. Analyze the time complexity.

2.2. (L) Write a program using an incremental (conventional) approach to multiply the given matrices.

2.3. (T) Write a pseudocode to multiply the given matrices using the divide and conquer approach. Analyze the time complexity.

2.4. (L) Write a program using the divide-and-conquer approach to multiply the given matrices.