Mid Semester

Subject: CS205, Date: 11/09/17, Duration: 2 hour 30 min

An m × n Young tableau is an m × n matrix such that the entries of each row are in sorted order from left to right and the entries of each column are in sorted order from top to bottom. Some of the entries of a Young tableau may be ∞, which we treat as nonexistent elements. Thus a Young tableau can be used to hold r ≤ mn numbers.

Here's an example of a 4x4 Young tableau containing the elements {9, 16, 3, 2, 4, 8, 5, 14, 12}. Note that this is not unique.

2	4	9	∞
3	8	16	∞
5	14	∞	∞
12	∞	∞	∞

A. Write a C Program to implement **EXTRACT-MIN** on a nonempty m×n **Young tableau** that runs in **O(m+n)** time. Extract-Min should maintain the property of Young tableau. (Hint: use a recursive subroutine that solves an **m×n** problem by recursively solving either an **(m -1)×n** or an **m×(n-1)** subproblem.) **[5]**
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B. Write a C Program to insert a new element into a non full m×n **Young tableau** in **O(m+n)** time. **[5]**
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