

K. N. Toosi University of Technology

Algorithm Design Course
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The Ted Mosby

June 04, 2021

Overview

Let me tell you something about Ted Mosby. He is a great architect but not really good at communications although he has been recently working on a design of a skyscraper which made him so successful in his career that the New York magazine landed him on the cover of a magazine as the youngest architect to design a skyscraper in New York city.

Ted is now in a wedding with a copy of the magazine and he wants to tell everyone about what he achieved in order to make some "Friends", He prepared this sentence to say at loud so many people would hear him : "Guess who is on the cover of the New York magazine", but there is a problem.

The problem is this is a wedding and everybody wants to dance on a different schedule and if they are dancing they won't be able to hear what Ted just said, For instance people i is not dancing only on a single closed interval $[a_i, b_i]$.

Ted wants to say the line at certain times t_1, \dots, t_m . Anyone who is not dancing at time t_j will hear Ted. It's okay if someone hears the message more than once, but Ted wants everyone hear him at least once.

Goals

1. **Help Ted and Design a greedy algorithm** which takes as input the list of intervals $[a_i, b_i]$ and output a list of times t_1, \dots, t_m so that m is as small as possible and so that everyone hears the message at least once. Your algorithm should run in time $O(n \log(n))$.