Greedy Sweeps

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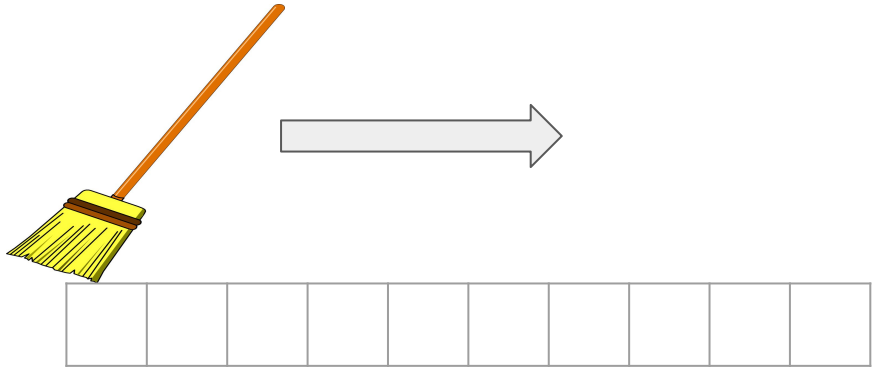

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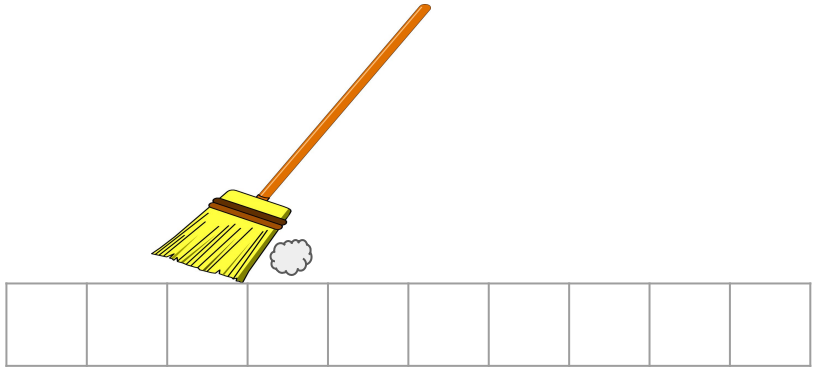

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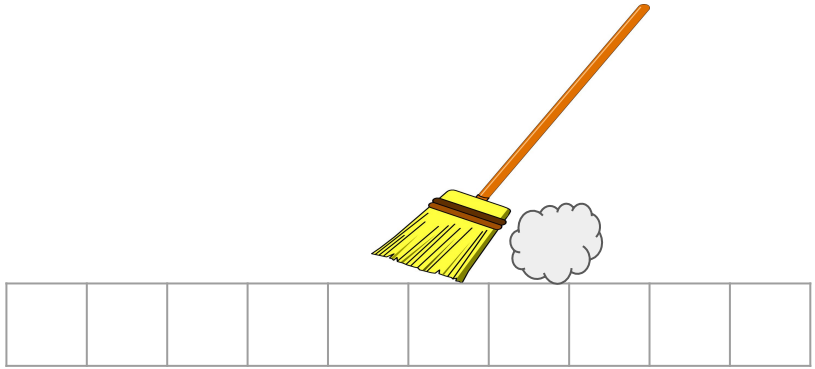

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We need to ensure that the data is in the correct order.

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The data needs to “sorted”

Example Problem

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B/C of remote learning not all the students are in the zoom call at the same time T_T

I know when each student will enter and leave the meeting (assume no student will re-enter)

What is the minimum number of times I need to mention the deadline to ensure all students are aware?

Observations/Ideas

Working with an array of students could be challenging

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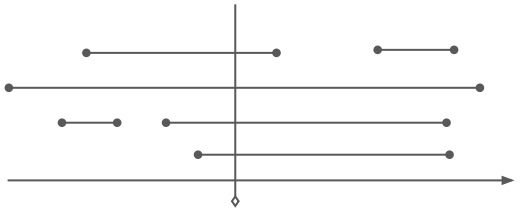

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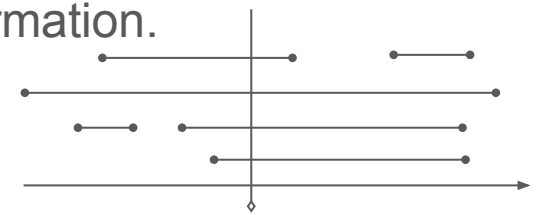

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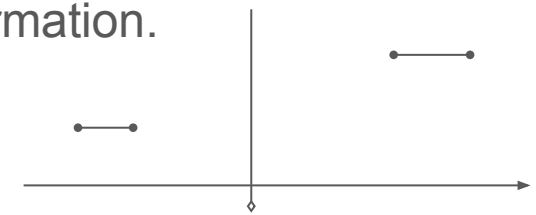

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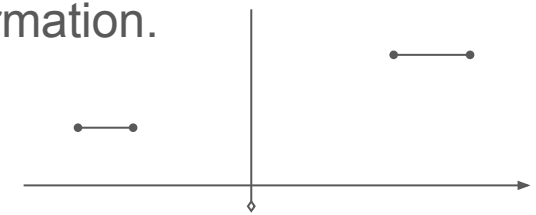

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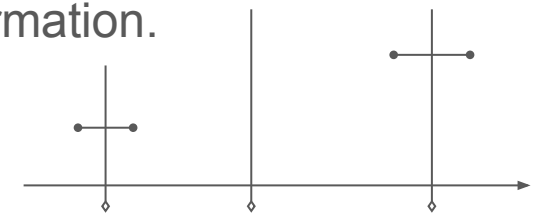

Optimizing Answers

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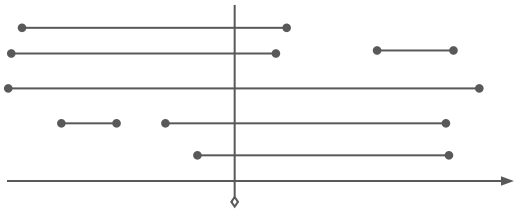

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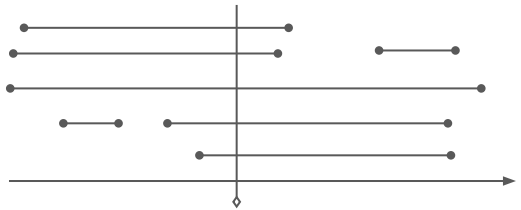

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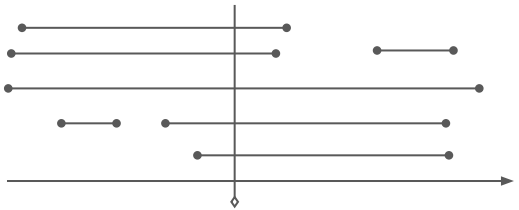

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Be lazy

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Consider the following,

When a student leaves we must have informed them beforehand.

Be lazy

Wait until an uninformed student is just about to leave, and then hit everyone with some knowledge

Proving This is Correct

We need to perform an exchange argument.

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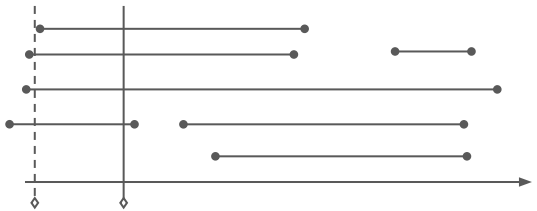

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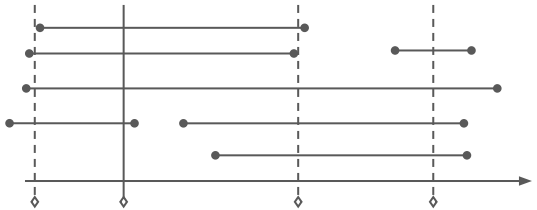

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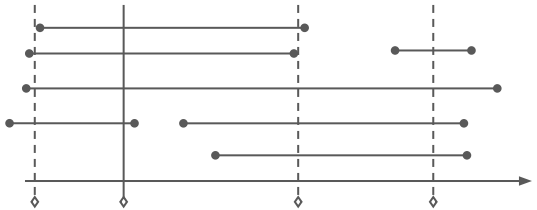
We need to perform an exchange argument.

- “FTSOC Suppose an ideal solution performed a knowledge sesh earlier”
- We would show that we have an ideal solution could exists by moving forward the time by patchworking with the ideal solution.
- Thus the ideal solution should do a later knowledge session.



Another Problem: Food Display Arrangement

Your friend works at a local grocery store and has the task of arranging produce. At the end of the day your friend needs to fix the order of the food. All the customers move the produce around (without buying it those jerks), and some lazy coworkers dumped all the new food in one spot.

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What is the least number of passes required by your friend?

FDA Strategy

How could we solve this greedily?

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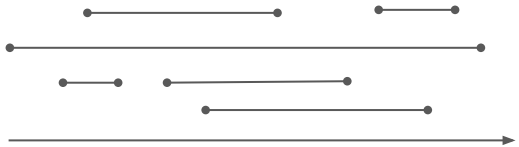

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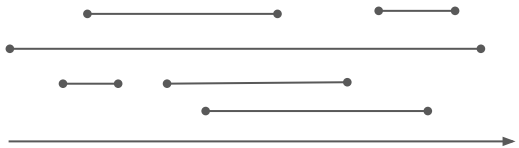

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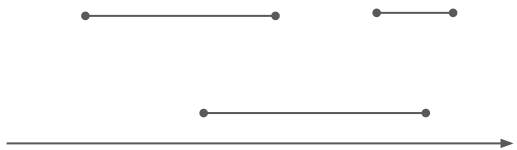

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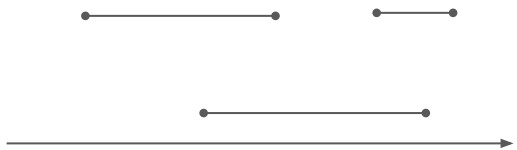
INVALID =>



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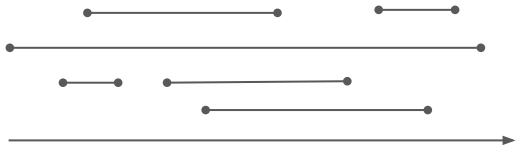

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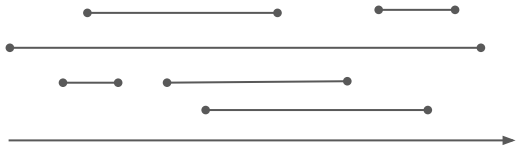
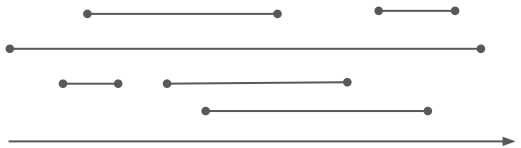


Find maximum non-overlapping subset.

Non-Overlapping Subset Strategy

How do we do this?



Non-Overlapping Subset Strategy

How do we do this?

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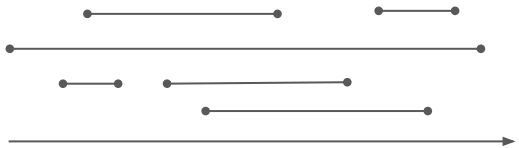

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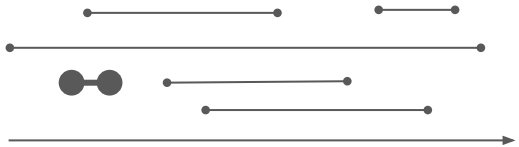

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Non-Overlapping Subset Strategy

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Repeat…

Non-Overlapping Subset Strategy

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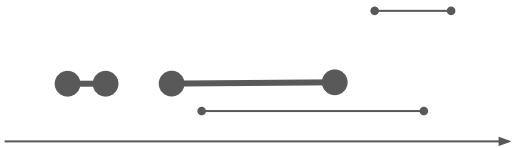

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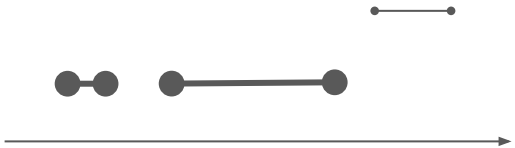

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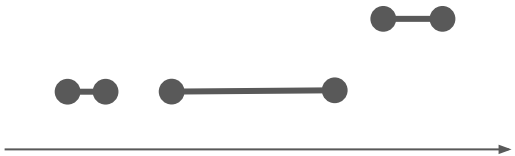

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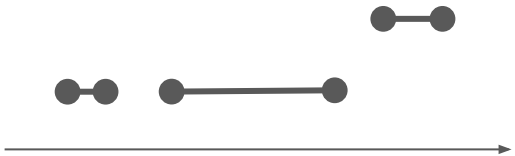

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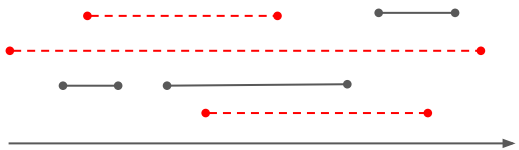
3 types had to move



High-Level

```
Convert to intervals
Sort by End Points (smallest first)
Make the Last End Point Used (LEPU) be -infinity
Let movedIntervals be 0
Loop through sorted intervals
   If the currentInterval.start is after the LEPU
      Update LEPU to currentInterval.end
   Else
      Increment movedIntervals by 1
   End If
End Loop
Return movedIntervals
```