EXCHANGE ARGUMENTS

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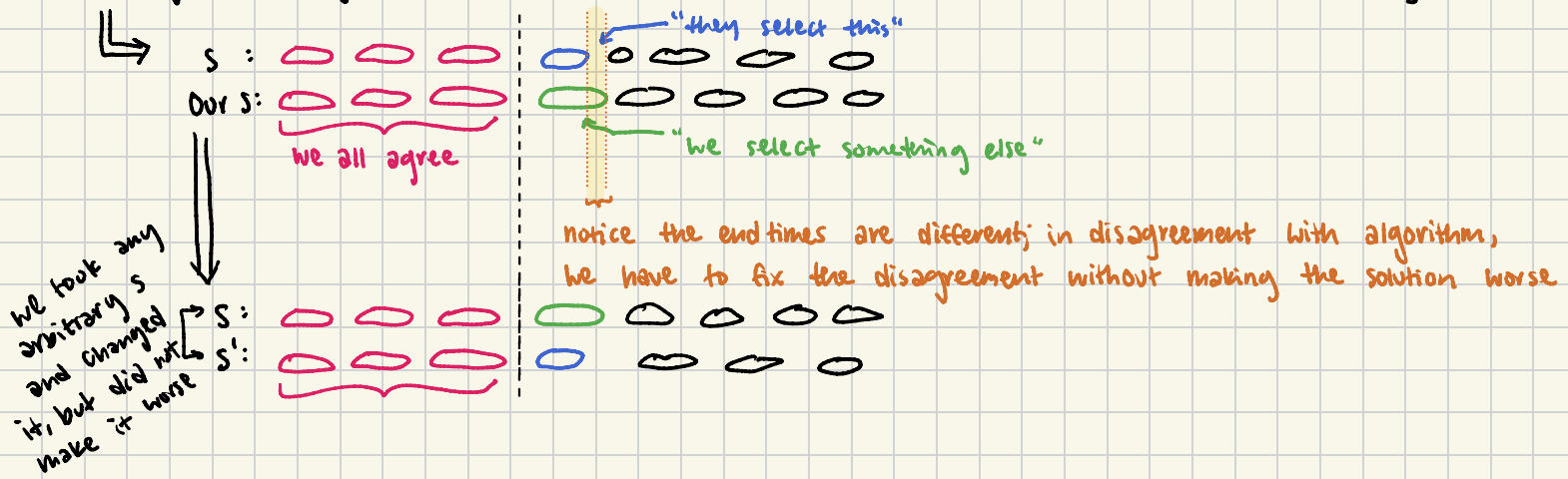
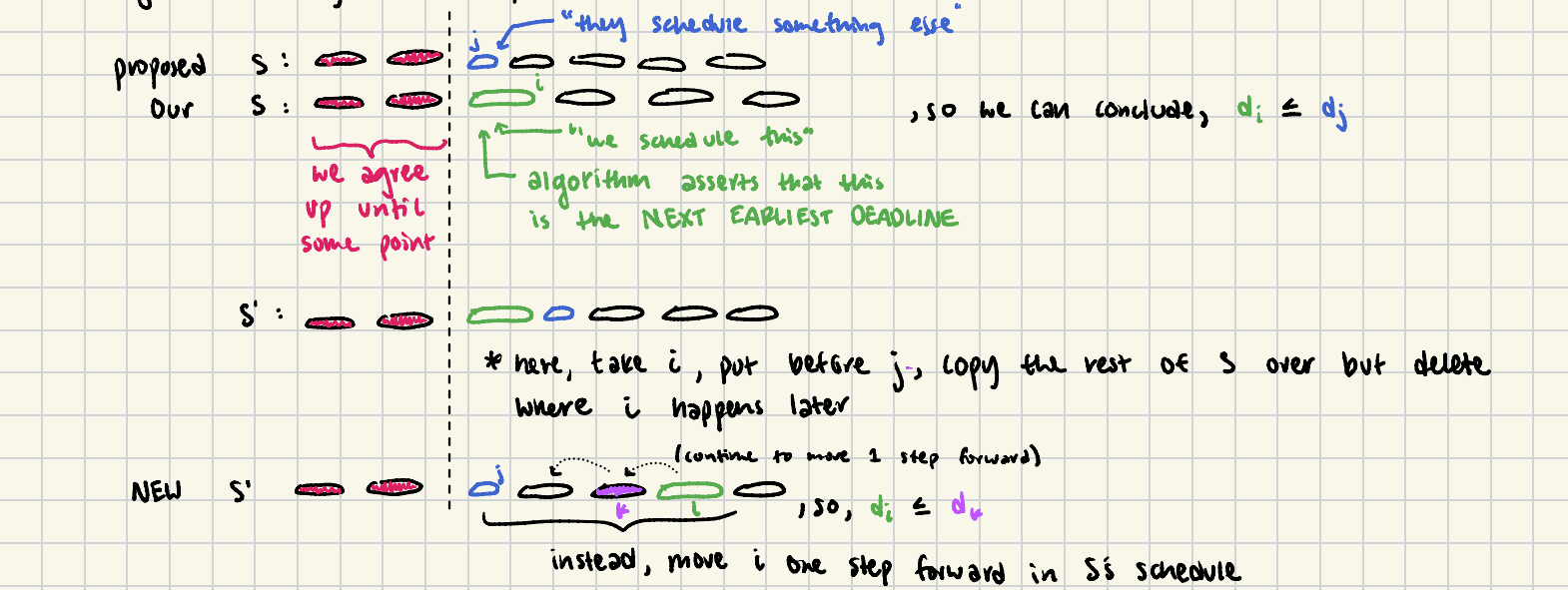
- take any proposed (feasible) solution (s) for the given problem, then look for the first disagreement between S and the solution we produce
- make a new solution S' for S that:
  - ① fixes the disagreement without introducing earlier disagreements
  - ② doesn't reduce the quality of the solution (S' is at least as good as S)

MAXIMAL INTERVAL SELECTION
- input: a collection of intervals in time
- output: the biggest subset of non-overlapping intervals (max number of intervals)
- Alg: Sort by endtime, select the interval that ends earliest, delete all overlapping intervals



HOMEWORK PROBLEM EXAMPLE

input: collection of assignments, each with a deadline and processing times
output: schedule of assignments that minimizes the summed lateness
Alg: sort by deadlines process



, so we can conclude, $d_i \leq d_j$

* here, take i, put before j, copy the rest of S over but delete where i happens later

, so, $d_i \leq d_k$

instead, move i one step forward in S's schedule

* IF i finishes <u>before</u> its deadline in S:
  ↳ k now finishes when i is finished in S, which was before its deadline, which was before k's deadline, so k finishes before its deadline

* IF i finishes <u>after</u> its deadline in S:
  ↳ Before : $\left[(\text{the time } i \text{ finished}) - d_i\right] + \left[(\text{the time } k \text{ finished}) - d_k\right]$

  ↳ After : $\left[(\text{new time } i \text{ finishes}) - d_i)\right] + \left[(\text{the time } i \text{ finished}) - d_k\right]$