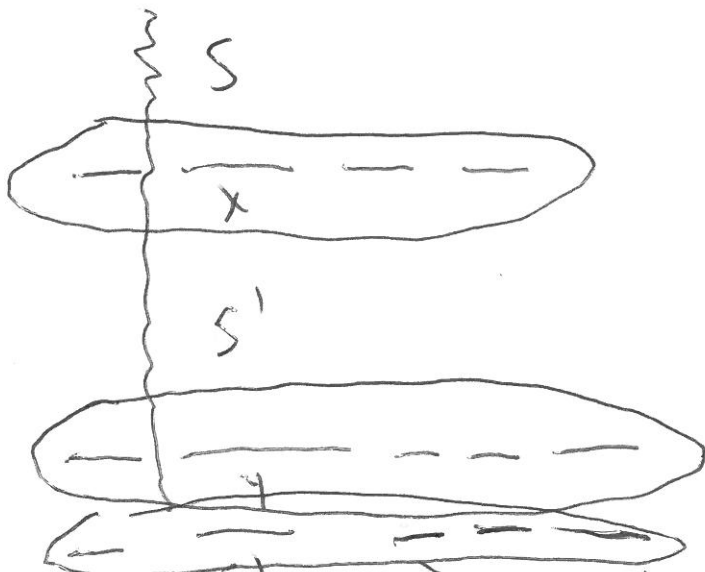begin end

$\exists$ start + duration + n such that GreedySearch finds an incorrect answer. Let S is set output by GS, and $\exists$ S' that is non-overlapping and $|S'| > |S|$.

S

x

S'

$\exists y \in S'$ that is not in S. Let y be the earliest.

Since $y \notin S$, GS must have selected an overlapping w/s x. B/c GS selected x, x ends before y.
Consider $T = S' - \{y\} \cup \{x\}$. $|T| = |S'| > |S|$.

All workshops earlier than y are non-overlapping b/c GIS. Every w/s after y in T was after y/c

of y, which is after end of x. Therefore, T contains no overlaps. Repeating this process, we produce a new solution T', where $|T'| = |S|$, but $|T'| = |S'| > |S| = |T|$.