

We start by proving the following lemma:

Lemma 0.1 Exchanging the positions of neighbouring pupils doesn't change the final answer.

Proof Suppose the two neighbouring pupils in consideration are b_i and b_{i+1} for some $1 \leq i < n$. Assume that now all of the pupils in the queue before them have already chosen their dishes. We consider the following four cases:

- Case 1: $b_i \geq b_{i+1}$ and there exists an a_j such that $b_i \geq a_j > b_{i+1}$.

In this case, it is clear that the choices made by b_i and b_{i+1} don't interfere with each other at all.

- Case 2: $b_i \geq b_{i+1}$ and there doesn't exist an a_j such that $b_i \geq a_j > b_{i+1}$.

For this case, the two dish values that are chosen will always be the two most expensive dish values (could be repeated) less than or equal to b_{i+1} .

- Case 3: $b_i \leq b_{i+1}$ and there exists an a_j such that $b_i < a_j \leq b_{i+1}$.

This is similar to Case 1, where the choices don't interfere.

- Case 4: $b_i \leq b_{i+1}$ and there doesn't exist an a_j such that $b_i < a_j \leq b_{i+1}$.

This is similar to Case 2, where the two dish values to be chosen are always the two most expensive dish values (could be repeated) less than or equal to b_i .

In all of the four cases, exchanging the order of b_i and b_{i+1} doesn't change the final dish values chosen. Thus, it doesn't change the final answer, and the lemma is true. \square

Using Lemma 0.1, we can conclude that the order of the waiting queue of pupils doesn't matter in this problem because we could keep exchanging neighbouring students to arrive at any permutation of students.

Following this, it's not hard to notice that the answer for the current lists $\{a_i\}_{i=1}^n, \{b_i\}_{i=1}^m$ is simply the largest x for which the number of dishes with costs greater than or equal to x is strictly greater than the number of students with money greater than or equal to x . This idea can be easily implemented using a segmenttree.