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Ethics in Computer Science
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Airline Seating Algorithm

The purpose of this algorithm is to optimize seating for economy passengers on a typical flight. Regular customers pay a fee to choose their seat from any available on the plane at time of booking. Economy passengers are assigned their seat 24 hours prior to takeoff. The algorithm does its best to seat groups near each other, as seating family members and friends far away from each other can cause problems during evacuations and emergency situations. Also, it's cruel to separate them…

Algorithm considerations:

Regular customer – May choose their seat.

Economy customers – Will be assigned seat 24 hours prior to takeoff.

Regular customers get to choose their seat on a first come first serve basis. All seats are same price.

Algorithm for sorting economy passengers:

Priority sorting is given to groups. Passengers who buy their tickets together will be considered a group. Groups of 4-6 or more will be seated in the same row or two consecutive rows if possible. If not possible, the group will be split up into smaller groups of 2-3 and sat in 2-3 seat pods as close to each other as possible. A 3-seat section with 1 seat across the aisle will be considered a 3-seat pod for this arrangement. In the event that not all groups can be seated this way, groups containing children under 13 will be given priority. If a pair can not be seated next to each other, the algorithm with prioritize sitting them in consecutive rows back to back. If not all pairs can be seated next to each other or in consecutive rows, groups of 3 will be split up 2-1 to ensure that pairs can be seated next to each other or in consecutive rows.

When all groups have been seated, all remaining single-ticket customers will be randomly assigned a remaining seat.

The algorithm does not take into account the relative quality of a seat (aisle vs. middle, front of plane vs. back, etc.) and only considers proximity to other passengers in one's group.

How it will work:

The computer will keep track of the number and size of all groups of economy passengers, and will also flag groups that contain children under 13 for priority seating. It will also keep track of the number and size of each type of seating "pod" (2-seat, 3-seat, 4-seat, etc.). If the computer anticipates that not all groups will be able to sit next to each other, groups of 3 will be split up 2-1 before pairs are split up and the algorithm will run again.