'Creating Measures' Awkward-ness Task - Example #5

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This problem gives you the chance to:

- invent your own measure for the concept of "awkward-ness"
- use your measure to put situations in order of "awkward-ness"
- generalize your measure to work in different situations.

- Have you ever arrived at a packed theater after the show has started?
- You have to make everyone stand while you squeeze past to take your seat.
- Imagine that five people A, B, C, D and E each arrive to take their seat in a theater.
- They are not allowed to take different seats to the one they have been allocated.

This diagram shows the order in which they arrive and their seating positions:

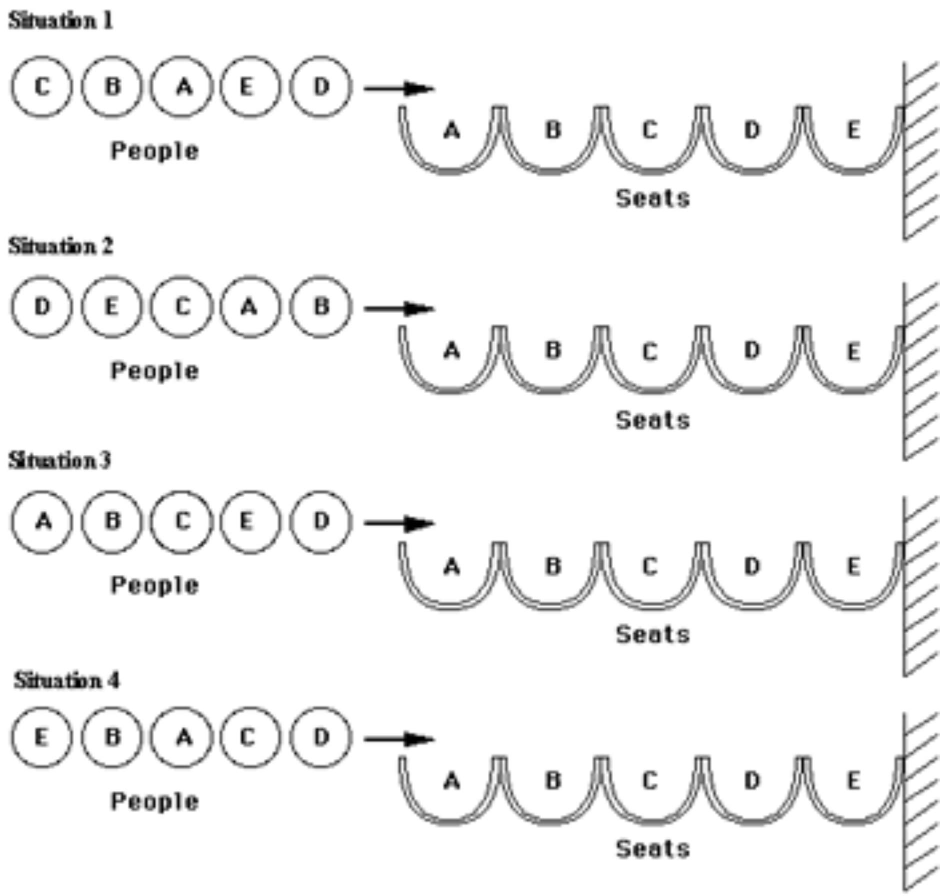
- So, D arrives first and sits in the second seat from the right hand end of the row.
- Then E arrives. D has to stand up while E squeezes into the last seat in the row.
- Then A arrives. She sits on the first seat of the row.
- Now B arrives and makes A stand, while he takes the second seat in.
- Finally C arrives and makes both A and B stand up while she takes her seat.

Warm-up

Try out this situation from different starting points using scraps of paper labeled A, B C, D and E until you can see what is happening.
What is the most awkward situation you can devise?

Draw it below:

Here are four movie theater situations:



1. Place the four situations in order of "awkward-ness."
    - Which is the easiest situation for people?
    - Which is the most awkward?
    - Explain how you decided.

2. Invent a way of measuring "awkward-ness." This should give a number to each situation. Explain carefully how your method works.

3. Show how you can use your measure to place the four situations in order of "awkward-ness." Show all your work.

4. Adapt your measure so that the minimum value it can take is 0 (where no-one is made to stand up) and the maximum it can take is 1 (the most awkard situation possible).

5. Show how your measure in part 4 may be generalised for any number of people entering a row. (That is when *n* people enter a row with *n* available seats).