Seat Booking

When ticket booking is brought up, it is for booking a place in some location which can hold only a limited number of people. With this, it is usually expected that the person availing these seats gets to choose the seat or position. Train tickets are different in the sense that it doesn’t allow for this. Why would this be the case? Well it could simply be summed up as ‘because physics’.

Trains are large, heavy and massive objects that move at extreme speeds, given their weight. This means that stability while in motion is of the utmost importance. If people were allowed to book wherever they wanted, the weight distribution within coaches would now be random every time the train moves. Because of this uneven distribution, the train could meet with a major accident and be extremely unsafe.  
  
So in practical day to day activities, train seats are assigned, not chosen. There is a feature built into train ticket distributing software which considers the train design that would be used in some particular journeys and then assigns seats such that there is even weight distribution to maximise safety. Now how exactly would one assign these seats? Well to understand this, we must first understand how exactly berths are distributed in trains.

The coach has a rectangular pipe structure and berths are assigned perpendicular to the longer walls, three for each wall. One is at the bottom, another in the middle and the last, on the top. If we fill up the seats at the bottom, that would be alright and desirable. Likewise, if we fill up any of the other two sections only, then it would be safe. This is because the weight is evenly distributed. As we fill up the higher berths, however, the center of mass of the coach goes up and up. If this continues, the train becomes easier to topple over to one side if it experiences a sideways force.  
Now sideways forces that would actually topple the train is nonexistent as the tracks and speed of the train are chosen such that it is mitigated. This is true only if the weights are evenly distributed since then it is possible to predict a safe speed for any curve on a track. This theory falls flat as soon as there is an imbalance as it would be impossible to predict a safe speed. This is because the coach would now tend to lean on one side. Now the picture looks bad since sideways forces on train journeys can be enough to topple it over.  
By allowing a random distribution of tickets by allowing people to choose their seats, the chance that the trains are stable drops as humans wouldn’t naturally choose a ticket seat that would make weight sharing uniform.

The solution to make trains safe would be to allow a software to give out seats. The software chooses seats such that the average distribution of coaches is uniform. This does affect the **train ticket availability** however, since now people would not be assigned an empty seat if the program concludes that it would be unsafe to book that seat. Thus, an individual wouldn’t get to choose a seat in trains. They would be only assigned seats.