# EFFICIENT BOARDING ON AIRPLANES

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Time is a critical commodity in aviation. An important parameter here is the turnaround time, which indicates how much time an aircraft needs between landing and the next takeoff at the airport. Low-cost airlines like Southwest (USA) or RyanAir (Europe) base their entire business model on keeping their own costs as low as possible in order to be able to offer cheap airline tickets. One factor that influences the turnaround time is passenger boarding. Boarding takes a certain amount of time which is determined by the behaviour of the passengers.
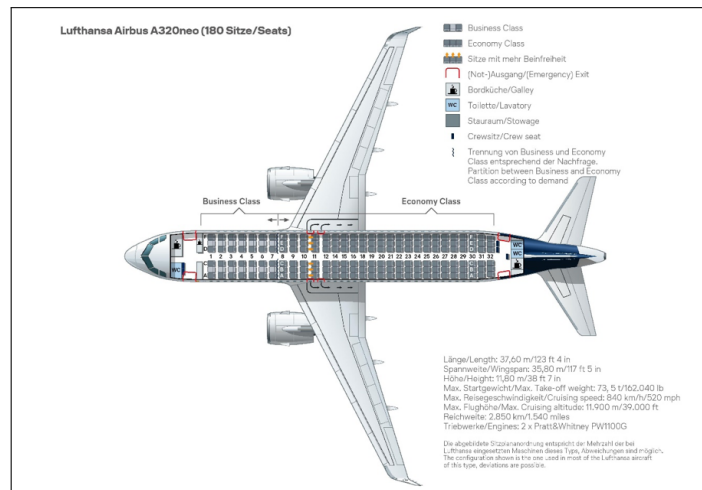
Seating plan for the Lufthansa Airbus A320neo

Problem: The aircraft (the picture shows an Airbus A320neo) has 32 rows. Of these, 7 rows are Business Class with 4 seats per row and the other 25 rows are Economy Class with 6 seats per row. At a parking position at the gate and boarding over the so-called finger, the passengers board the aircraft between the cockpit and row 1. Your task is to determine an efficient boarding strategy in order to get all passengers on board and on their seats as quickly as possible.

Consider that walking through the aircraft, stowing hand luggage, sitting down and getting up to make room for other passengers takes time. There are also so-called priority passengers who are often allowed to board first due to their booking (business class), status (frequent flyers), and other reasons. You can suppose that all seats on the aircraft will be occupied.
Also consider the time it takes for passengers to sort themselves before boarding. In addition, there is always a certain number of passengers who board too early (pusher, Drängler) or too late (Zuspätkommer).

To what extent does the boarding process and your solution depend on the aircraft type (e.g. Airbus A350 with two gears in Economy Class). What other measures could make the boarding process more efficient?