

Q3

You are given a time schedule of arrivals a_i and departures d_i of n trains, so $1 \leq i \leq n$, during each 24 hour period (note: a train can arrive before the midnight and leave after midnight; each train arrives and departs at the same time every day). You need to find the minimum number of platforms so that each train can stay at a platform without interfering with other arrivals and departures.

Answer :

Main idea: firstly, go through the schedule for the arrival and departure of the trains and count number of trains that arrive before midnight and depart after midnight. This will be the initial value for the two counters.

- One that counts the number of trains present at the station at any point of time.
- And another counter that represents the minimum number of platforms needed at that time.
- Next merge the times for the **remaining** arrivals and departures into one list which means do not include trains which arrive before midnight and depart after. Now sort by time and iterate through that list checking:
 - If a train is scheduled to arrive next, we increase the trains counter by 1 and update the minimum platforms needed **if** the count is more than the minimum platforms needed so far.
 - If a train is scheduled to depart next, we decrease the counter of the number of trains by 1
- One edge case we need to handle is when two trains are scheduled to arrive and depart at the same time.
 - In this case we depart the train first.
- Once the iteration has ended return the count for the minimum number of platforms needed.