

## Analysis: GBus count

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Given the serving range of every GBus, we need to determine the number of GBuses serving a particular list of cities. If we start from the leftmost city and move towards the right, we can make the following observations.

1. There will be a certain point where the GBus starts to contribute to the total number of GBuses for a given city. This certain point is the left end of the GBus serving range (which is  $A_i$  for  $i$ -th GBus).
2. And there will be another certain point where the GBus is out of the serving range, and it will never come back again. This certain point is one city to the right of the right end of the GBus serving range (which is  $B_{i+1}$  for  $i$ -th GBus).

Based on the two observations above, let us start formulating a solution.

- For each city, we maintain the total number of GBuses whose left end point is at this city. Denote this value as  $X_i$  for  $i$ -th city.
- Similarly, we maintain the total number of GBuses whose right end point is one city to the left of this city. Denote this value as  $Y_i$  for  $i$ -th city.
- Now we can simply scan the cities from left to right. For  $i$ -th city, we add  $X_i$  to the current total number of GBuses (initially 0), which denotes the number of GBuses that starts to contribute to the total number at this point. Then, we subtract  $Y_i$  from the current total number of GBuses, which denotes the number of GBuses that no longer contribute to the total number at this point.
- After that, for each city from the query, we just output the total number pre calculated for that city.

The time complexity for the solution will be linearly dependent on the maximum number of cities that a GBus can serve, which can be at most 5000 given the constraints of both test sets.