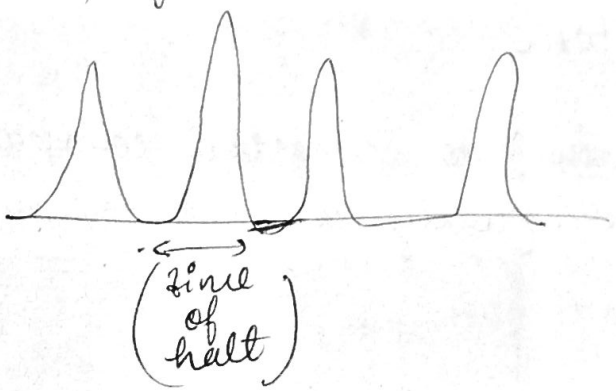
Inflow or movement majorly depends on the relative capacities of the trains

$$f(i, i+1) = K(n_{i+1} - n_i)$$

we assume linear ϕ relation for movement {or inflow b/w compartment}

- Account for + for increasing & - ve for decreasing populations. {K be the proportionality constant}

Let $(F_{i,j})$ be the inflow at the j^{th} station



Let there be (n) stations during the journey.

So during the journey total inflow

$$= \sum_{j=1}^{n} F_{i,j} \quad \forall\, t > t_j$$ {t_j time it stops at the j^{th} station}

So the single (i^{th}) compartment

$$\sum_{\substack{j=1 \\ \forall\, t > t_j}}^{n} F_{i,j} + f(i, i+1) + f(i, i-1) = \frac{dN_i}{dt}$$

N_i = no of passengers in the i^{th} compartment at any given time