Train Seat Optimization Problem

Problem Statement:

The train has 1 bogie with maximum seating of 120. There are 20 stops/stations along the route. Passengers can board and deboard at any different stations, make a seat optimization essential to maximize occupancy.

Constraints:

1. Passengers should not change their seats once assigned.
2. Families and groups should be seated together whenever possible. If an exact fit isn't available, the group should be split into the largest possible subgroups to maximize seat occupancy.
3. Passengers have different journey lengths, meaning some might board or deboard at different stations.
4. Seat reassignment is allowed once a passenger vacates their seat.
5. The coupe structure is fixed and cannot be changed.
6. Individual passengers can be assigned available seats if no group seating options are left.

Example of seating position of

Coupe-1	
1	3,4
2	5,6
Coupe-2	
7	9,10
8	11,12