ABC Medical Supplies Company has a total of 12 salespeople it wants to assign to three regions—the South, the East, and the Midwest. A salesperson in the South earns $600 in profit per month for the company, a salesperson in the East earns $540, and a salesperson in the Midwest earns $375.

The southern region can have a maximum assignment of five salespeople. The company has a total of $750 per day available for expenses for all 12 salespeople. A salesperson in the South has average expenses of $80 per day, a salesperson in the East has average expenses of $70 per day, and a salesperson in the Midwest has average daily expenses of $50.

The company wants to determine the number of salespeople to assign to each region to maximize profit.

1. Formulate an integer programming model for this problem.
2. Solve this model using R.