California State University, East Bay

College of Business and Economics

BAN 630: Optimization for Analytics

**Homework 3**

**Due: 11:59 pm Sunday, July 12, 2020**

Instructions:

* **Build Optimization/Simulation Models to solve this homework.**
* Explain your answer and reasoning clearly.
* You may work in groups, but write/type your own homework report.
* **You can use the template to solve the questions but feel free to put aside the template and build your own models.**
* **Upload your finished Excel file unto Blackboard.**

Question 1

Eight students need to be assigned to four dorm rooms (two students to a room) at State University. Based on incompatibility measures, the “cost” incurred if two students room together is shown in the excel template file. How should these students be assigned to rooms to minimize the total incompatibility? (Hint: The trick is that any solution in the red cells is a permutation of 1 to 8, so an alldifferent constraint works. Similar to Traveling Salesperson’s problem.)

Question 2

W. L. Brown, a direct marketer of women’s clothing, must determine how many telephone operators to schedule during each part of the day. W. L. Brown estimates that the number of phone calls received each hour of a typical eight-hour shift can be described by a discrete probability distribution in the excel template file. Each operator can handle 15 calls per hour and costs the company $20 per hour. Each phone call that is not handled is assumed to cost the company $6 in lost profit. Considering the options of employing 6, 8, 10, 12, 14, or 16 operators, use simulation to determine the number of operators that minimizes the expected hourly cost (labor costs plus lost profits).