Operations Research, Spring 2020 (108-2) Case Assignment 1

經濟三 b06303059 謝君模
地理三 b06208030 何承諭
生工三 b06602043 黃崇晉
資工系 T08902130 何良富
經濟三 b06303077 江雨柔

1. Executive Summary

   The Operations Research (OR) team has created a proposed CSR scheduling plan. Using the new plan, we achieved a lack of 277. This plan consists of the following three phases:

   1. Manager assign fixed requirements and requests
   2. Manager assign leave, night shift and afternoon shift
   3. Manager uses the Optimization program created by the OR team to derive the optimal schedule

   For phase 1, after the requirements (Shift Request, Leave Request, Manager Limit) are entered into the MS Excel file, the Manager can run the Analysis program to determine the maximum number of CSRs required for each day. The Analysis program will output another MS Excel file which highlights the lack for each half-hour period.

   For phase 2, the manager will assign the CSRs schedule in the sequence recommended by the OR team. The manager can rerun the Analysis program as required to get the updated lack information, as well as any regulations that are not met.

   For phase 3, after the leave, night shift and afternoon shift are allocated by the Manager, the Manager will run the Optimization program to assign the remaining day shift. The Optimization program will run though the different permutations of allocating the day shift and will return the schedule which gives the lowest lack.

   In conclusion, by using the Analysis and Optimization program, the CSR Manager will be able to create a better schedule in a shorter period of time. The rules check within both programs will ensure that the regulations are not violated.

2. Describe the method

   a. scheduling
      i. First, we throw all the special requests in, including the manager limit, shift requests and leave requests. These are the requirements that needed to be satisfied, so we set them as a principle which we cannot change in order to lower the lacks. (Graph 1)
      ii. Then, we decide the day offs. Days with higher demands we put less day-offs, and for the lower demands we put more day-offs. Then we

randomly decide who gets the day-off and the number of people who get the shift 0. (Graph 2 Assign Leave)

iii. After that, we begin with the night shift. We first arrange the higher positions and finally to the associates , while meeting the demands and the rules given to us. (Graph 2 Assign Night Shift)

iv. Next, we arrange the afternoon shift . Following the same pattern as we did for the night shift. (Graph 2 Assign Afternoon Shift)

v. Lastly, there are still some spots left behind , we use the computer to help us generate different charts by filling these spots with 1~4 shifts randomly, and try to find the lowest lacks.

b. checking method and counting lack

i. For all rules must be followed , we make a debugger to check the “senior limit” and “manager limit” etc. If there is any schedule unsuitable for the rules, we can find out where the schedule is violated, and print out the Id and the shift where it is wrong. (Graph 3)

ii. After the schedule is confirmed, with the Demands for CSRs we can find out the lack amount. We build a program to calculate the total lack for us.

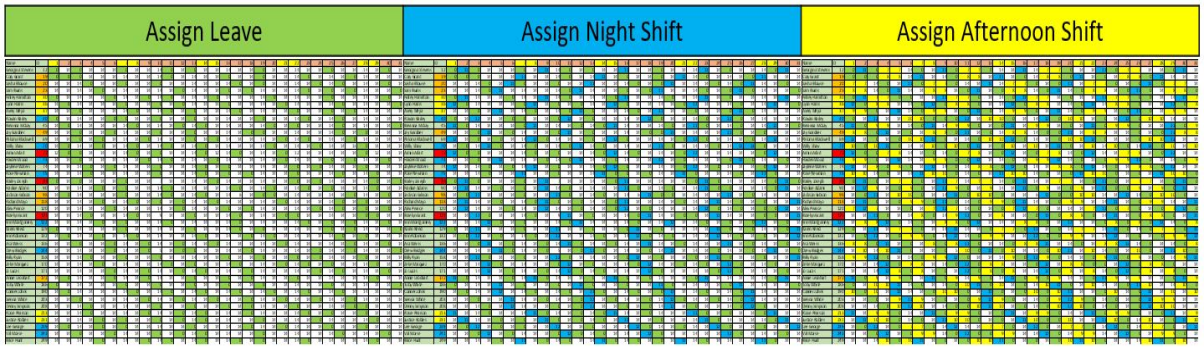
iii. Finally , we print out the chart of the smallest lack.

3. More information

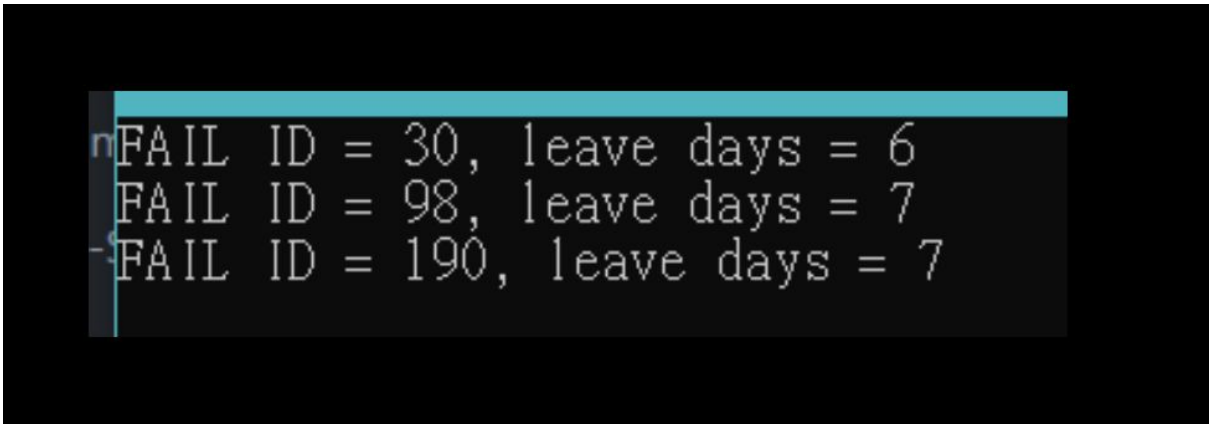
iv.

Name	ID	1	2	3	14	15	17	19	20	22	27	29	30	31
Georgina Stevens	12	14	14	0	14	14	14	14	14	14	14	14	14	14
Cory Grant	19	0	0	0	14	14	14	14	14	14	14	14	14	14
Sasha Blouse	20	14	14	14	14	14	14	14	14	14	14	14	14	14
Willy Shaw	70	14	14	14	14	14	14	14	14	14	13	14	14	14
Armin Arlart	72	12	14	14	14	12	14	14	14	12	14	12	14	14
Frankie Adams	90	14	14	14	14	14	14	14	0	14	14	14	14	14
Jackson Gibson	98	14	14	14	14	14	6	0	0	14	14	14	14	14
Richard Mayo	118	14	14	14	14	0	14	14	14	14	14	14	14	14
Justice Robles	231	14	14	14	0	14	14	14	14	14	14	14	14	14
Lee George	239	14	14	14	14	14	14	14	14	14	14	14	14	14
Val Morse	241	14	14	14	14	14	14	14	14	14	14	14	14	14
Brice Hunt	249	14	14	14	14	14	14	14	14	14	14	14	14	14

(Graph 1)



(Graph 2)



（graph 3）