Project 2 (Based on true story)

An owner of manufacturing facility has asked you to help you with scheduling the shifts of his workers for **2021**. The facility works every day of the year, and the shifts to be covered are:

- 7 shifts to be covered: C1, C2, C3, C4, C5, C6, C7 during the weekdays.
- 3 shifts to be covered: C1, C2 and C7 during the weekend.

You have three workers categories, and the list of the workers initials are presented next:

- The Senior Associates(SA): CR,FM,MY,BB
- The Junior workers(JW): JB,RK ,CK,CY
- The senior workers(SW): HT, AY, CA, GK

The following rules have to be put in place in working the schedule:

- Those who are work C7 are off the next day.
- A worker can be assigned at most to one shift per day
- SA can cover the following shifts: C1 and C4 during weekdays, C1 and C2 on weekends
- JW can cover the following shifts: C2, C3, C5, C6, C7 on weekdays, C1, C2, C7 on weekends
- SW can cover the following shifts: C1, C2, C3, C4, C5, C6 on weekdays, C1, C2 on weekends

The objective of this schedule is to balance the load across the workers as much as possible. The following balancing constraints has to be taken into account (as much as possible):

- The number of shifts during the weekdays, The number of shifts during weekends
- Every worker category has to be balanced separately

a) *Find a feasible schedule for the first quarter of 2021*
b) *Find a feasible schedule for 2021*