Homework
Chapter 7: Airline Schedule Optimization

Contact Info: Vivek Kumar (vkumar3@gmu.edu) Eng Building Room 4504

1. For the Example shown below, calculate the Maximum Possible Revenue. Then use this information to fill in the last 4 columns of the last table using 'Itinerary based Spilling' (as shown in Table 7.9 of the textbook). Which is the best 'Fleeting scenario'? Note: You can also use the attached Excel sheet for your convenience.

Demand Data

Market	Itinerary	Number of PAX	Average Fare
X-Y	1	150	200
Y-Z	2	100	225
X-Z	1,2	100	300

Fleet Type	Seats
A	150
B	200

Operating Cost ($)

Fleet Type	Flight 1	Flight 2
A	10000	20000
B	20000	39500

Fleeting	Flight 1-2	Operating Cost	Spilled PAX	Spill Cost	Contribution
I	A-A				
II	A-B				
III	B-A				
IV	B-B				

2. Implement FAM:
   You have been hired right out of SYST 660 to be the chief scheduler for a newly formed airline, Eventually Airways ("we will get you there … eventually"®). EA can lease up to **2** Boeing 737-500 and **2** Airbus A320. The relevant data for each of these aircraft types are as follow:

Aircraft type	Seats	Turn Time
Boeing 737-500	108	15 minutes
Airbus A320	144	15 minutes

EA flies between three airports: A, B and C. The relevant data for each flight leg is contained in the following schedule table:

Flight Number	Origin	Destination	Departure	Arrival
301	A	B	8:30AM	10:15AM
102	C	B	9:00AM	10:30AM
101	B	C	11:00AM	12:30PM
302	B	A	2:00PM	3:45PM
201	C	A	2:15PM	3:15PM
202	A	C	4:30PM	5:30PM

c(i,k) in $		
Flight Legs(i)	**B737**	**A320**
301	13664.7	13500
102	13571.52	13000
101	13608	13000
302	13624	13500
201	7200	9000
202	6000	9000

a) Draw the daily timeline network for any aircraft type and compute the number of variables, i.e. f and y.
b) For the Basic Fleet Assignment Model discussed on Pg 189-191 of the book clearly define your variables (f and y), parameters and sets($F,K,M^k,N^k,G^k,O,I,n^+,n^-,CL(k), CG(k), c^i_k$)
c) Implement FAM in MPL. You may modify the provided sample code (FAM.mpl). Submit your MPL code to vkumar3@gmu.edu along with Daily Timeline Network. Plan for 24 hour turn-around.
d) How would you model the following additional constraint:
   Due to restrictions, fleet A320 cannot fly into airport A.