Chapter 3-5 Airline Economics, Markets & Demand, Cost

Home Work:

1.
   a. Given the following Airline Profit Strategies
      i. Cutting Fares/ Yields
      ii. Increasing Fares/ Yields
      iii. Increase Flights (ASM)
      iv. Decrease Flights (ASM)
      v. Improve Passenger Service Quality
      vi. Reduce Passenger Service Quality
   b.
      i. Which strategy would be favorable, given a Price Elasticity of Demand of -.8 (Ep = -.8)
      ii. Which strategy would be favorable, given a Price Elasticity of Demand of -1.2 (Ep = -1.2)

2. Given the following Airline Market Example, Calculate the following:

Market	Itinerary	Segment / Leg	Airline	Seats	PAX	Connect PAX	Traffic	% Connecting	Load Factor	Daily Freq
IAD-BOS	IAD-BOS	IAD-BOS	Airline 1	200	140	N/A	140	N/A	0.70	3
IAD-BOS	IAD-PHL-BOS	IAD-PHL	Airline 1	150	125	75	50	75%	0.83	5
	IAD-PHL-BOS	PHL-BOS	Airline 1	150	75	N/A	75	N/A	0.50	5
IAD-BOS	IAD-JFK-BOS	IAD-JFK	Airline 2	250	200	100	100	50%	0.80	7
	IAD-JFK-BOS	JFK-BOS	Airline 2	150	100	N/A	100	N/A	0.67	7
IAD-BOS	IAD-BOS	IAD-BOS	Airline 2	100	80	N/A	80	N/A	0.80	2
IAD-PIT	IAD-BOS-PIT	IAD-BOS	Airline 2	200	150	75	75	50%	0.75	4
	IAD-BOS-PIT	BOS-PIT	Airline 2	150	75	N/A	75	N/A	0.50	4

   a. For this example no additional passengers are boarding at the connection
   b. Frequency Share for IAD-BOS =
   c. Market Share for IAD-BOS =
   d. "Market" O-D Traffic for IAD-BOS =
   e. "Segment" or "Leg" O-D Supply for IAD-BOS =
   f. RPM =
   g. ASM =
   h. ALLF for IAD-BOS =
   i. ALF for this network – for this example all flight legs are 1 unit of distance

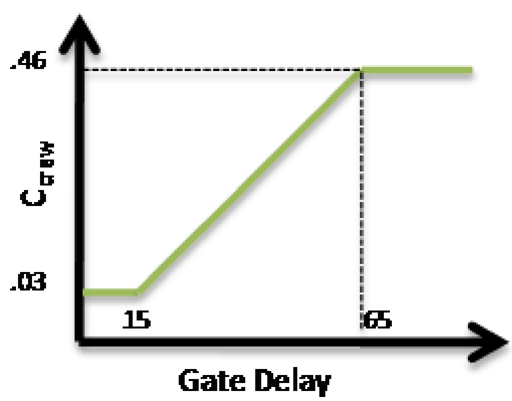
3. Given the following flight performance data for 7/7/2007 departures from JFK to ORD:

		min	min	min			$/min	$/min	$/min	$/min
FLTNO	TAILNO	gate delay	taxi delay	air delay	no_seats	seat_group	maint	crew	taxi fuel	fuel
1066	CCA1066	389	23	10	416	325	$ 18	$ 37	$ 5.79	$116
83	N804CA	30	52.2	4	50	50	$ 5	$ 9	$ 0.73	$ 15
447	N936CA	0	14.2	7	50	50	$ 5	$ 9	$ 0.73	$ 15
469	N398CA	0	28.2	3	50	50	$ 5	$ 9	$ 0.73	$ 15
492	N956CA	0	20.2	5	50	50	$ 5	$ 9	$ 0.73	$ 15
634	N964CA	28	17.2	4	50	50	$ 5	$ 9	$ 0.73	$ 15
85	CPA85	0	0	3	416	325	$ 18	$ 37	$ 5.79	$116
133	N689EC	0	15.6	1	50	50	$ 5	$ 9	$ 0.73	$ 15
392	N632AE	0	20.6	0	50	50	$ 5	$ 9	$ 0.73	$ 15
903	N506JB	0	3.9	0	164	175	$ 7	$ 14	$ 2.09	$ 42
907	N249JB	0	35.9	10	98	100	$ 6	$ 13	$ 1.42	$ 28
915	N509JB	24	0.9	3	164	175	$ 7	$ 14	$ 2.09	$ 42
917	N249JB	0	10.9	6	98	100	$ 6	$ 13	$ 1.42	$ 28
919	N548JB	41	25.9	0	164	175	$ 7	$ 14	$ 2.09	$ 42
8624	WOA8624	7	15	6	323	325	$ 18	$ 37	$ 5.79	$116

And the following delay cost model:

$C_{delay} = c_{fuel} \times \text{fuel burn rate} \times \text{fuel price} + c_{crew} \times \text{crew cost} + c_{other} \times \text{other cost}$

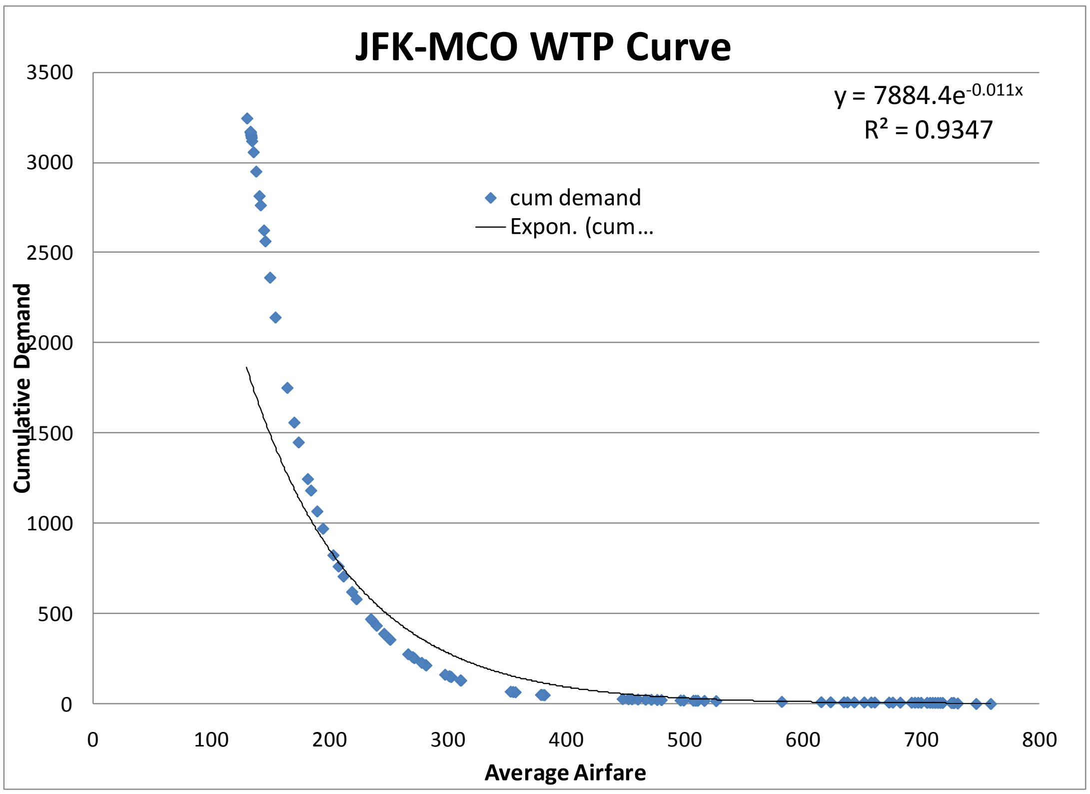
	Crew Coefficient		Other Cost
	<= 15 min	>=65 min	$/min
Gate Delay	0.03	0.46	$ 0.21
Taxi Delay	0	0.43	$ 0.12
Air Delay	0.01	0.46	$ 0.10



a. Calculate total gate, taxi, and air delay costs.
b. Which aircraft seat group had the greatest gate, taxi, and air delay costs?

4. Given the following information about the JFK-MCO market:
Average 9 flights per day
Average 3240 passengers per day
$130 Average Fare
LF=.8

Revenue = Demand*Price = Demand*(Ln(Demand) - Ln(M))/Coeff
Coeff = -0.011
M = 7884.4
Cost = # flights * (landing Fee + avg hrs * ($DOC_{\text{less fuel/hr}}$ + Burn Rate * fuel price))
Demand = # flights * Aircraft Size * LF



Seats	.8 load factor	Burn Rate	DOC-Fuel/Hr		fuel price	landing fees		MCO hrs	Cost per flight	cost per fl
25	20	202	$	640	$2	$	112	2.50	$2,720.10	$108.80
50	40	435	$	854	$2	$	137	2.50	$4,448.70	$88.97
75	60	458	$	779	$2	$	218	2.48	$4,426.13	$59.02
100	80	854	$	1,154	$2	$	330	2.48	$7,437.46	$74.37
125	100	844	$	1,074	$2	$	356	2.88	$8,320.10	$66.56
150	120	963	$	1,150	$2	$	367	2.67	$8,571.32	$57.14
175	140	1,252	$	1,277	$2	$	686	2.72	$10,959.68	$62.63
200	160	1,428	$	649	$2	$	546	2.63	$9,772.95	$48.86
225	180	1,723	$	1,786	$2	$	945	2.77	$15,423.23	$68.55
250	200	1,942	$	1,842	$2	$	904	2.77	$16,762.87	$67.05
275	220	2,236	$	1,377	$2	$	904	2.80	$17,280.69	$62.84
300	240	3,125	$	3,084	$2	$	904	2.80	$27,039.50	$90.13
325	260	3,471	$	3,301	$2	$	904	2.80	$29,584.54	$91.03

a. Calculate and plot Revenue (y axis) versus demand (x axis), Cost (y axis) versus demand (x axis), and profit (y axis) versus demand (x axis) for all “Seats” shown in the table above. Note: Demand = .8*seat size.
    i. 5 flights per day
    ii. 10 flights per day
    iii. 20 flights per day
b. Using the charts from part (a), what aircraft size and average airfare is the most profitable for:
    i. 5 flights per day
    ii. 10 flights per day
    iii. 20 flights per day