RUN FOR YOUR FLIGHT

Additional Pilot Information

Ruth

Flight Number	Origination City	Departure Time	Destination City	Arrival Time	Flight Length
767	Phoenix	8:00 a.m.	Seattle	9:45 a.m.	2.75 hours
268	Seattle	10:30 a.m.	Los Angeles	1:15 p.m.	2.75 hours
465	Los Angeles	1:45 p.m.	Seattle	4:15 p.m.	2.5 hours

Layover in Seattle

Leg 1

What is the likelihood that Ruth will depart Phoenix in time to fly to Los Angeles? (Be sure to explain your calculations.)

Ruth has a 45-minute layover in Seattle before flying to Los Angeles. Therefore, her departure from Phoenix must not be delayed more than 45 minutes.

a. What is the likelihood that Ruth will have a delayed departure from Phoenix?

(# Departure Delays) ÷ #Total Departures =
(# Air Traffic Delays + # Weather Delays) ÷ # Total Departures = (21 + 4) ÷ 144 = 25 ÷ 144 = 0.174 or 17.4%

b. If flight 767 is delayed, what is the likelihood that the delay will be more than 45 minutes?

(# delays > 45 minutes) ÷ (# of delays) =
(# delays 46 – 60 minutes + # delays 61 – 75 minutes + # delays 76 – 90 minutes + # delays > 90 minutes) ÷ (# Air Traffic Delays + # Weather Delays) =
(7 +6 + 5 + 3) ÷ (21 + 4) = 21 ÷ 25 = 0.84 or 84%

c. What is the likelihood that flight 767 will be delayed AND the delay will be more than 45 minutes?

(likelihood of a late departure) x (likelihood of the departure being > 45 minutes) =
17.4% x 84% = 0.174 x 0.84 = 0.1462 or 14.6%
— OR —
((21 delays due to air traffic + 4 delays due to weather) ÷ 144 total departure flights) x ((7 delays 46 – 60 minutes + 6 delays 61 – 75 minutes + 5 delays 76 – 90 minutes + 3 delays > 90 minutes) ÷ (21 Air Traffic Delays + 4 Weather Delays)
= (25 ÷ 144) x (21 ÷ 25) = (0.174) X (0.84) = 0.1462 or 14.6%

d. What is the likelihood that Ruth will arrive in Seattle in time to fly to Los Angeles?

100% - 14.6% = 85.4%
Ruth has an 85.4% chance of arriving on time.

Leg 2
What is the likelihood that Ruth will depart Seattle in time to fly back to Seattle?

Ruth has a 30-minute layover in Los Angeles before flying back to Seattle. Therefore, her departure from Seattle must not be delayed more than 30 minutes.

(likelihood of a late departure) x (likelihood of the departure being > 30 minutes) =
((21 delays due to air traffic + 29 delays due to weather) ÷ 173 total departure flights) x ((6 delays 31 – 45 minutes + 12 delays 46 – 60 minutes + 11 delays 61 – 75 minutes + 11 delays 76 – 90 minutes + 7 delays > 90 minutes) ÷ (21 Air Traffic Delays + 29 Weather Delays))

= (50 ÷ 173) x (47 ÷ 50) = (0.289) x (0.94) = 0.2717 or 27.2%

Therefore, the likelihood that she will arrive in time is 100% - 27.2% or 72.8%.

Fill in the table below with the results of your computations.

Ruth

Flight No.	Orig. City	Dep. Time	Dest. City	Arr. Time	Flight Length	Likelihood of on-time Departure	Accumulated Likelihood
767	Phoenix	8:00 a.m.	Seattle	9:45 a.m.	2.75 hrs	85.4%	85.4%
268	Seattle	10:30 a.m.	Los Angeles	1:15 p.m.	2.75 hrs	72.8%	62.2%
465	Los Angeles	1:45 p.m.	Seattle	4:15 p.m.	2.5 hrs		

Layover in Seattle

If a pilot has less than a 75% chance of arriving in time for the next flight, a standby pilot must be ready to fly. Will a delayed arrival or departure for Ruth reach a point at which a standby pilot must be scheduled?

Because the likelihood of Ruth's departing Seattle in time to make the return flight is less than 75 percent, a standby pilot should be scheduled for her flight from Los Angeles to Seattle.

A standby pilot is called when the accumulated (compound) probability of arriving in time drops below 65%. Will the accumulated chance of a delayed arrival or departure for Ruth reach a point at which a standby pilot must be scheduled? If so, for which flight do you need a standby pilot?

Yes, the accumulated likelihood that Ruth will depart Seattle on time to make her return flight is 62.2%. 62.2% < 65%, so a standby pilot should be called to fly from Los Angeles to Seattle (though note that one has already been called due to the individual flight calculation).

Chuck

Flight Number	Origination City	Departure Time	Destination City	Arrival Time	Flight Length
483	Seattle	7:00 a.m.	San Francisco	9:00 a.m.	2 hours
376	San Francisco	10:15 a.m.	Phoenix	1:15 p.m.	2 hours
812	Phoenix	1:45 p.m.	San Francisco	2:45 p.m.	2 hours
421	Los Angeles	3:45 p.m.	Seattle	5:45 p.m.	2 hours

Leg 1
What is the likelihood that Chuck will depart Seattle in time to fly to Phoenix? (Be sure to explain your calculations.)

Chuck is scheduled to arrive in San Francisco 1 hour and 15 minutes, or 75 minutes, before his flight to Phoenix. Therefore, his departure from Seattle must NOT be delayed more than 75 minutes. The likelihood of this occurring is the likelihood of a late departure from Seattle times the likelihood of a late departure being delayed more than 75 minutes.

(likelihood of a late departure) x (likelihood of the departure being > 75 minutes) =

((21 delays due to air traffic + 29 delays due to weather) ÷ 173 total departure flights) x ((11 delays 76 – 90 minutes + 7 delays > 90 minutes) ÷ (21 air traffic delays + 29 weather delays))

= (50 ÷ 173) x (18 ÷ 50) = 0.289 X 0.36 = 0.104 or 10.4%

Therefore, the likelihood that he will depart in time is 100% - 10.4% or 89.6%.

Leg 2
What is the likelihood that Chuck will depart San Francisco in time to fly back to San Francisco?

Chuck is scheduled to arrive in Phoenix 30 minutes before his flight back to San Francisco. Therefore, his departure from San Francisco must not be delayed more than 30 minutes. The likelihood of this occurring is the likelihood of a late departure from San Francisco times the likelihood of a late departure being delayed more than 30 minutes.

(likelihood of a late departure x likelihood of the departure being > 30 minutes) =

((42 delays due to air traffic + 15 delays due to weather) ÷ 195 total departure flights) x ((4 delays 31 – 45 minutes + 13 delays 46 – 60 minutes +12 delays 61 – 75 minutes + 12 delays 76 – 90 minutes + 13 delays > 90 minutes) ÷ (42 air traffic delays + 15 weather delays))

= (57 ÷ 195) x (54 ÷ 57) = 0.292 X 0.947 = 0.2765 or 27.7%

Therefore, the likelihood that he will depart in time is 100% - 27.7% or 72.3%.

Leg 3
What is the likelihood that Chuck will depart Phoenix in time to fly to Seattle?

Chuck is scheduled to arrive in San Francisco 1 hour (60 minutes) before his flight to Seattle. Therefore, his departure from Phoenix must not be delayed more than 1 hour. The likelihood of this occurring is the likelihood of a late departure from Phoenix times the likelihood of a late departure being delayed > 60 minutes.

(likelihood of a late departure x likelihood of the departure being > 60 minutes) =

((21 delays due to air traffic + 4 delays due to weather) ÷ 144 total departure flights) x ((6 delays 61 – 75 minutes + 5 delays 76 – 90 minutes + 3 delays > 90 minutes) ÷ (21 air traffic delays + 4 weather delays) =

(25 ÷ 144) x (14 ÷ 25) = 0.1736 x 0.56 = 0.097 or 9.7%

Therefore, the likelihood that Chuck will depart in time is 100% - 9.7% or 90.3%.

Fill in the table below with the results of your computations.

Chuck

Flight No.	Orig. City	Dep. Time	Dest. City	Arr. Time	Flight Length	Likelihood of on-time Departure	Accumulated Likelihood
483	Seattle	7:00 a.m.	San Francisco	9:00 a.m.	2 hrs	89.6%	89.6%
376	San Francisco	10:15 a.m.	Phoenix	1:15 p.m.	2 hrs	72.3%	64.8%
812	Phoenix	1:45 p.m.	San Francisco	2:45 p.m.	2 hrs	90.3%	58.5%
421	San Francisco	3:45 p.m.	Seattle	5:45 p.m.	2 hrs		

If a pilot has less than a 75% chance of arriving in time for the next flight, a standby pilot must be ready to fly. Will a delayed arrival or departure for Chuck reach a point at which a standby pilot must be scheduled?

Because the likelihood of Chuck's departing San Francisco in time to make the return flight is less than 75 percent, a standby pilot should be scheduled for his flight from Phoenix to San Francisco.

A standby pilot is called when the accumulated (compound) probability of arriving in time drops below 65%. Will the accumulated chance of a delayed arrival or departure for Chuck reach a point at which a standby pilot must be scheduled? If so, for which flight do you need a standby pilot?

Yes, the accumulated likelihood that Chuck will depart San Francisco on time to make his return flight makes a compound likelihood 64.8%. 64.8% < 65%, so a standby pilot should be called to fly from Phoenix to San Francisco.