BUAN/OPRE 6398.003 Prescriptive Analytics

Homework 9

Team 6

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Q2.

Since λ = 45, x = 120, µ = 60

1. ≈ 1.039576e-20
2. p= 45/60 = .75, then hour = Joe can take average 15minutes per hour break.

Q3.

Since λ = 17, µ = 20

1. p = 17/20 = 0.85 = 85%
2. airplanes
3. (Average waiting time in the queue)

Then, Average waiting time in the queue \* Average fuel consumption for an aircraft stacking in the air \* liter of fuel cost = Average cost of fuel burned by an aircraft waiting to land

Average cost of fuel burned by an aircraft waiting to land = 0.2833\*60\*10L\*20$/L $3400



Q4.

Since λ = 20, µ = 30, p = 20/30 = 2/3

1. Since λ = 60/2.5 = 24

W = then, 5µ - 120 ≥ 60, then 5µ ≥ 180, which leads to µ ≥ 36.

So Linda has to serve 36 or more customers per hour during noontime rush to ensure that a noontime customer will not spend an average of more than 5minutes in the yogurt shop.

Q5

1. Since each secretary has λ=3, and µ=4, for one secretary,

W=hour to type a letter

1. For proposed system, having two secretaries, λ=6, and µ=4, k=2, p =

W=

Then, find first to plug into equation then plug into W equation.

, plugged into

, plugged into

, plugged into W

W= = hour to type a letter

1. Having two secretaries is more efficient since the time to type a letter is lower, 0.5714286 < 1
2. , with s =2, and which are very similar to manually calculated answers in (2).