

Taxi Stop

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Name

Date

You are the owner of a taxi company that services a large city. You have two storage areas where you store your cabs over night. One in town and a new one at your suburban headquarters. You have 200 cabs. How many should you park at each storage lot each night.

To help you make this decision you have collected the following information.

85% of the passengers that you pickup in the suburbs are taken to the suburbs. The remainder go to town.

55% of the passengers you pickup in town stay in town, the rest go to the suburbs. Each cab makes 30 trips a day.

Let $CS(n)$ = the number of cabs in the suburb on their n^{th} trip.
 $CS(n-1)$ = the number of cabs in the suburb on the trip before the n^{th} trip.
 $CC(n)$ = the number of cabs in the city on their n^{th} trip.
 $CC(n-1)$ = the number of cabs in the city on the trip before the n^{th} trip.

Using the information from above:

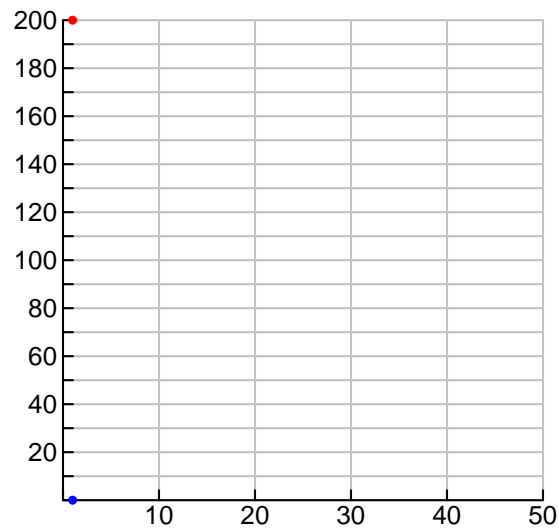
$$CS(n) = .85CS(n-1) + .45CC(n-1)$$

$$CC(n) = .15CS(n-1) + .55CC(n-1)$$

Create a spreadsheet to solve this problem assuming you presently store all your cabs at your in town location.

A spreadsheet has been started on the next page. Finish the spreadsheet by inserting formulas in columns C and D.

trip number	cs	cc		number starting in the suburbs			
1	.	200.		0			
2							
3				number starting in the city			
4				200			
5							
6				number ending in the suburbs			
7				.			
8							
9				number ending in the city			
10				.			
11							
12							
13							
14							



Create a plot of C2:C31 vs. A2:A31 and D2:D31 vs. A2:A31 to illustrate the change in locations of the cabs throughout the day.

1. How many cabs ended the day in each location?
2. Suppose you started with half the cabs in each location, how many would end the day at each location?
3. Try starting with different amounts at each location and notice where they end up. Do you see a pattern starting to form?
4. How many should start in town? Why?