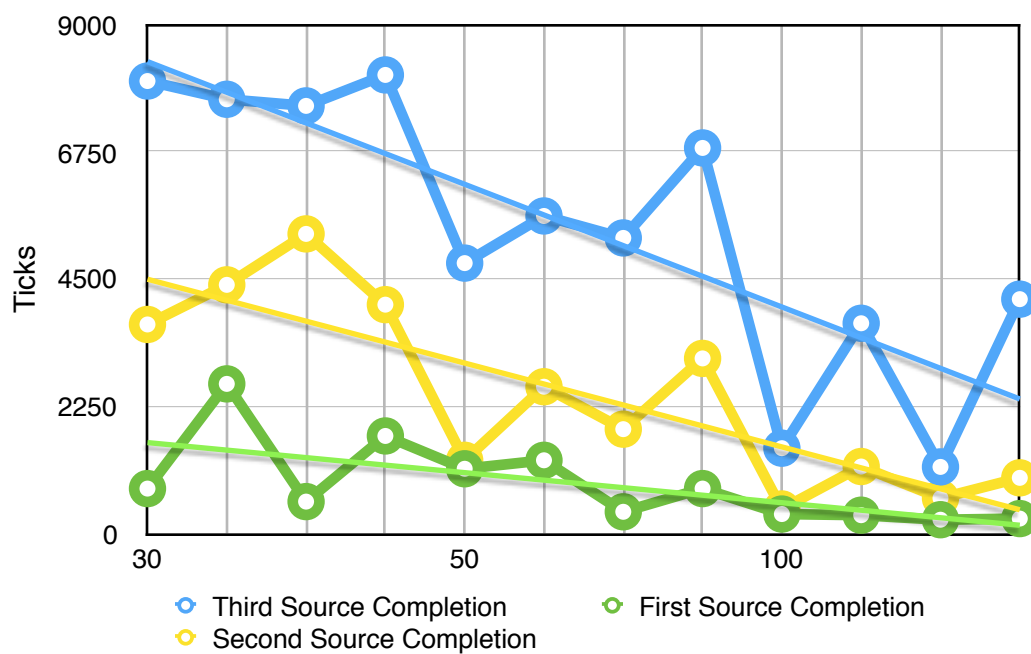


Question 2

Part A

Population	Diffusion-Rate	Evaporation-Rate	Total Tick Count	First Source Completion	Second Source Completion	Third Source Completion
30	40	10	8001	800	3700	8000
30	40	20	7679	2650	4400	7600
30	80	10	7562	570	5300	7500
30	80	20	8109	1730	4050	8100
50	40	10	4784	1150	1300	4700
50	40	20	5617	1300	2600	5600
50	80	10	5229	390	1850	5200
50	80	20	6819	800	3100	6800
100	40	10	1514	350	440	1500
100	40	20	3721	330	1190	3700
100	80	10	1183	250	630	1100
100	80	20	4147	270	990	4100

Ticks Vs Population



The strongest trend that can be observed from the data collected using the NetLogo Application is that as the population is increased, the total time taken for all sources to be depleted steadily decreased. As can be seen from the trend-lines, all sources decreased in time to depletion as the population was increased.

More specifically, the variance between values of the same population was due to both the diffusion-rate, and evaporation-rate. It can also be seen that the lower value of both rates allowed for a better completion time. Therefore, it can be observed that as population was increased, and both the diffusion-rate and evaporation-rate were maintained at their lower values, this produced the best result. This can be seen with the following data:

Population	Diffusion-Rate	Evaporation-Rate	Total Tick Count	First Source Completion	Second Source Completion	Third Source Completion
100	40	10	1514	350	440	1500
100	80	10	1183	250	630	1100

This data proves that with the highest population, and with the lowest evaporation-rate, the best results of the total experiment were found. The lowest amount of time seen throughout this experiment was an outlier to other results as it required the higher diffusion-rate. A reason for this is due to the larger population of ants converging on the source due to more ants being able to follow the path of the pheromone before it evaporated.