# Lab 1: Asterix and the Bazaar Experimental Study
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Experiment 1: Increasing Buyers Connected to a Single Seller

In this experiment, we hardcode the P2P network to have a single seller and a varying amount of connected buyers. Following the dynamic neighbor assignment design of our program, the exact network topology is slightly random. However, the seller still should be receiving concurrent requests. In this experiment, the seller was hosted on one machine while buyers were hosted on another. Below are the recorded response times of the buyers, in tabular and graph format:

Average Response Time With Single Seller and Multiple Buyers
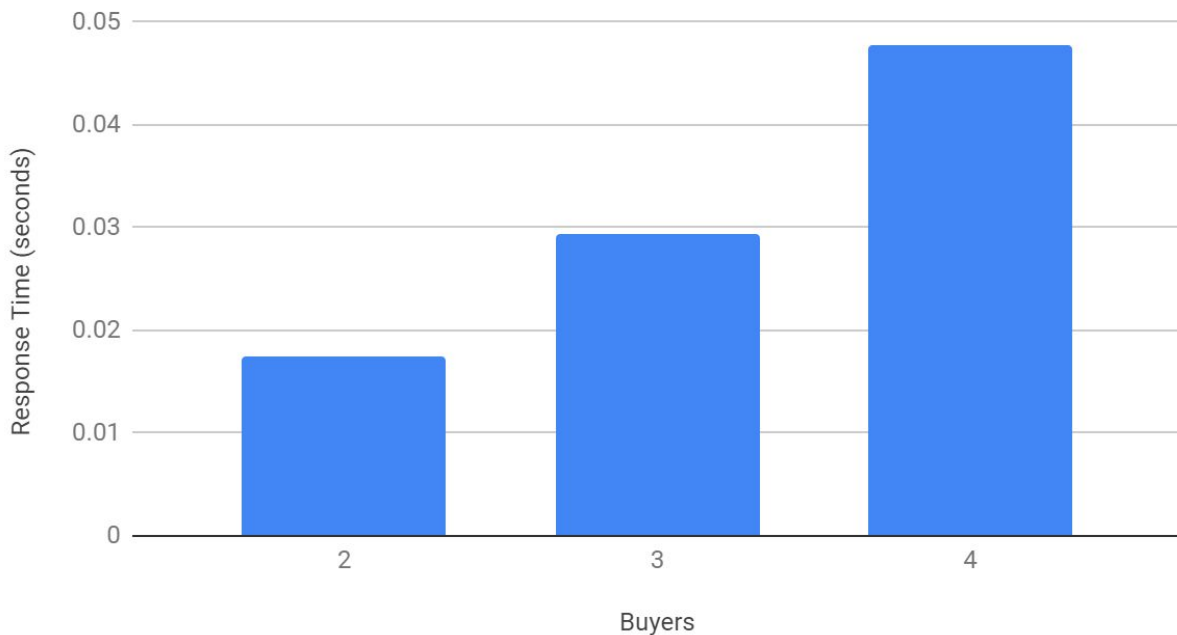
Average Response Time from 20 Iterations (sec), Each Buyer		
2 Buyers	3 Buyers	4 Buyers
0.0168	0.023	0.037
0.0182	0.027	0.047
	0.038	0.05
		0.057

From these numerical results, we can say at a glance that the response time increases when the seller receives increasing concurrent buyer requests. We would have liked to run experiments with more buyers, but ran into difficulty with server resources from sharing with other students (some nameservers had more than 25 other registered objects from other users.)

Experiment 2: 200 Sequential Requests to a Single Seller

In this experiment, we hardcode the P2P network to have a single seller on one machine, and a single buyer on another machine. We make 200 sequential requests (the handout asks for 1000, but this quantity was slightly outside the scope of our time limitations), and measure the response time of each. Below is a histogram of 200 observations:

Histogram of Response Times
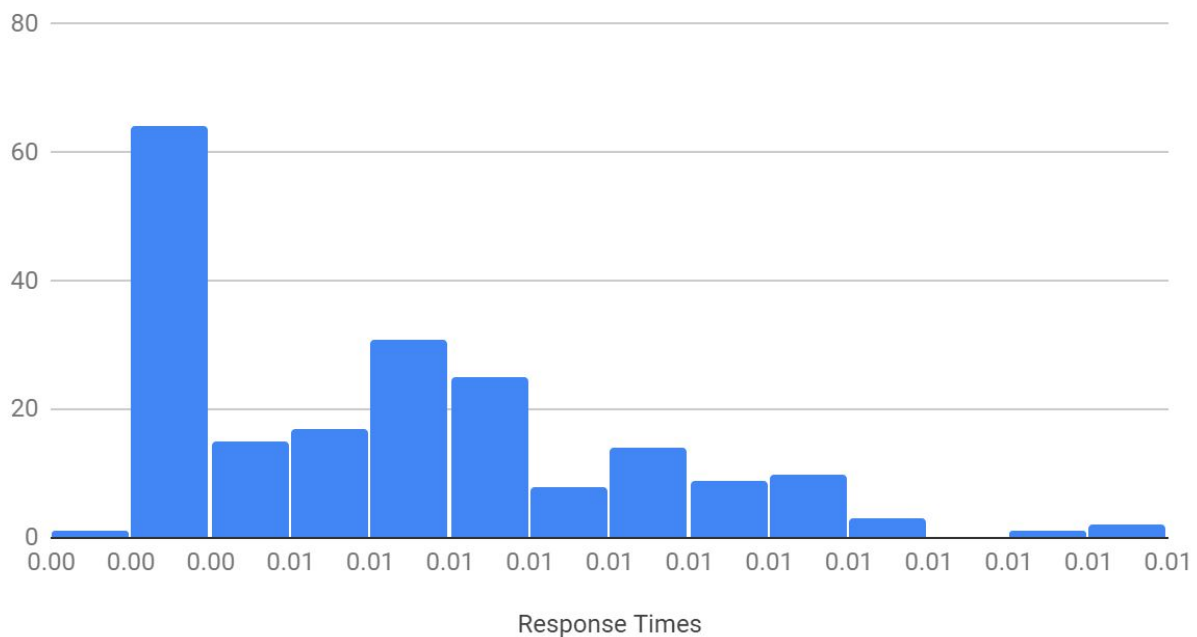
Response Times

The minimum response time was .002 seconds, the max response time was 0.014 seconds, with a mean response time of .006 seconds. We conclude from this that the average response time of sequential requests is almost 10x faster than the maximum response time of 4 concurrent buyers.