

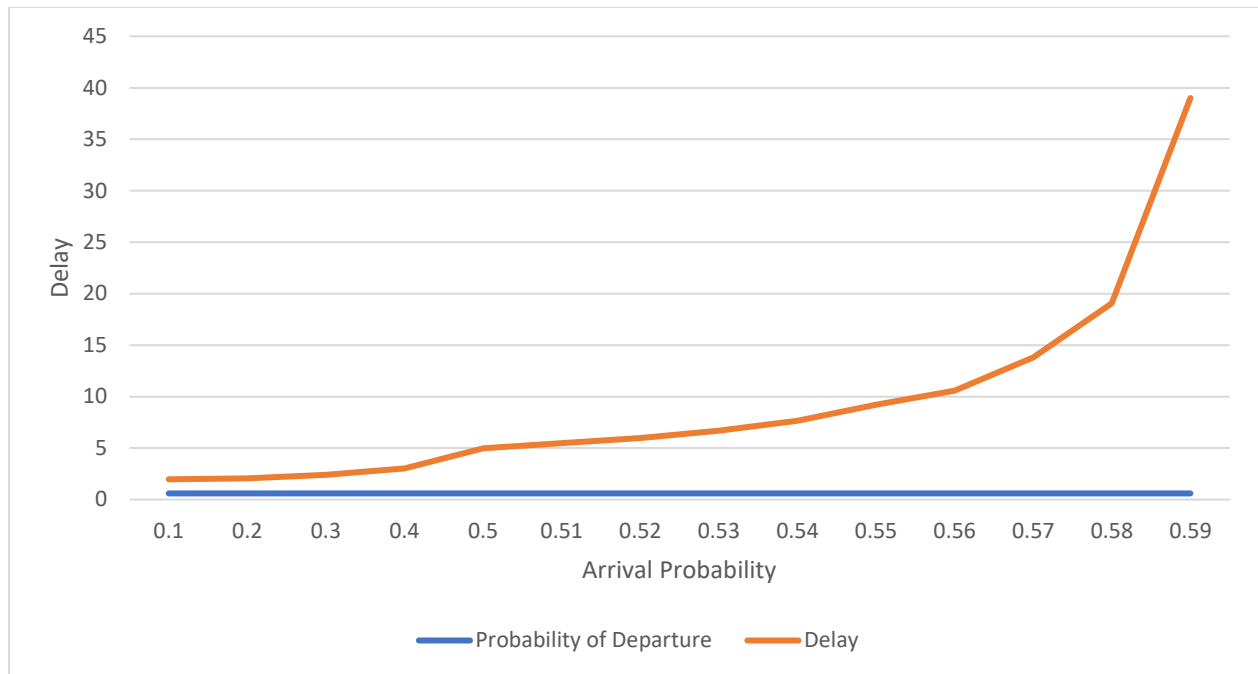
CODE OUTPUT

```

Run SingleServerQueue
"C:\Program Files (x86)\Java\jdk1.8.0_131\bin\java" ...
PROBABILITY 0.1
Average Delay1.9681699999999998
PROBABILITY 0.2
Average Delay2.075065
PROBABILITY 0.3
Average Delay2.3902200000000002
PROBABILITY 0.4
Average Delay3.0387975
PROBABILITY 0.5
Average Delay4.987104
PROBABILITY 0.51
Average Delay5.493613725490196
PROBABILITY 0.52
Average Delay5.973992307692307
PROBABILITY 0.53
Average Delay6.691924528301887
PROBABILITY 0.54
Average Delay7.651724074074073
PROBABILITY 0.55
Average Delay9.211936363636362
PROBABILITY 0.56
Average Delay10.567876785714285
PROBABILITY 0.57
Average Delay13.804963157894738
PROBABILITY 0.58
Average Delay19.05024482758621
PROBABILITY 0.59
Average Delay39.00460677966102

```

Probability Of Arrival	Probability of Departure	Delay
0.1	0.6	1.9681699999999998
0.2	0.6	2.075065
0.3	0.6	2.3902200000000002
0.4	0.6	3.0387975
0.5	0.6	4.987104
0.51	0.6	5.493613725490196
0.52	0.6	5.973992307692307
0.53	0.6	6.691924528301887
0.54	0.6	7.651724074074073
0.55	0.6	9.211936363636362
0.56	0.6	10.567876785714285
0.57	0.6	13.804963157894738
0.58	0.6	19.05024482758621
0.59	0.6	39.00460677966102



```

import com.sun.xml.internal.ws.api.message.Packet;

import javax.xml.transform.sax.SAXSource;
import java.util.ArrayList;
import java.util.LinkedList;
import java.util.Random;

public class SingleServerQueue {

    static final double departProbability = 0.6;

    public static void main(String[] args) {

        Random arrivalGenerator = new Random();

        double arrivalProbs[] = {0.1, 0.2, 0.3, 0.4, 0.5, 0.51, 0.52, 0.53, 0.54, 0.55,
0.56, 0.57, 0.58, 0.59};

        int[] lengths = new int[1000000];

        for (double probability : arrivalProbs) {
            System.out.println("PROBABILITY " + probability);

            lengths[0] = runSimulation(probability, arrivalGenerator, 0);
            for (int i = 1; i < lengths.length; i++) {
                int change = runSimulation(probability, arrivalGenerator, lengths[i-
1]);
                lengths[i] = lengths[i-1]+change;
            }
            double sum = 0;
            for (int x : lengths) {
                sum+=x;
            }
            System.out.println("Average Delay" + (sum/lengths.length)/probability);

            for (int i = 0; i < lengths.length; i++) {
                lengths[i] = 0;
            }
        }
    }

    private static int runSimulation(double p, Random arrivalGenerator, int prev) {
        int length = 0;
        double token = arrivalGenerator.nextInt(100);
        double arrivalProb = token/100;
        token = arrivalGenerator.nextInt(100);
        double departProb = token/100;

        if (arrivalProb <= p) {
            //System.out.println("ARRIVED");
            length++;
        }
        if (departProb <= departProbability && prev > 0) {
            //System.out.println("DEPARTED");
            length--;
        }
        return length;
    }
}

```