Christopher Gunadi

CSCI 3366-1

Homework 2

Note: All Java testing was performed using Dione00.

Java Sequential

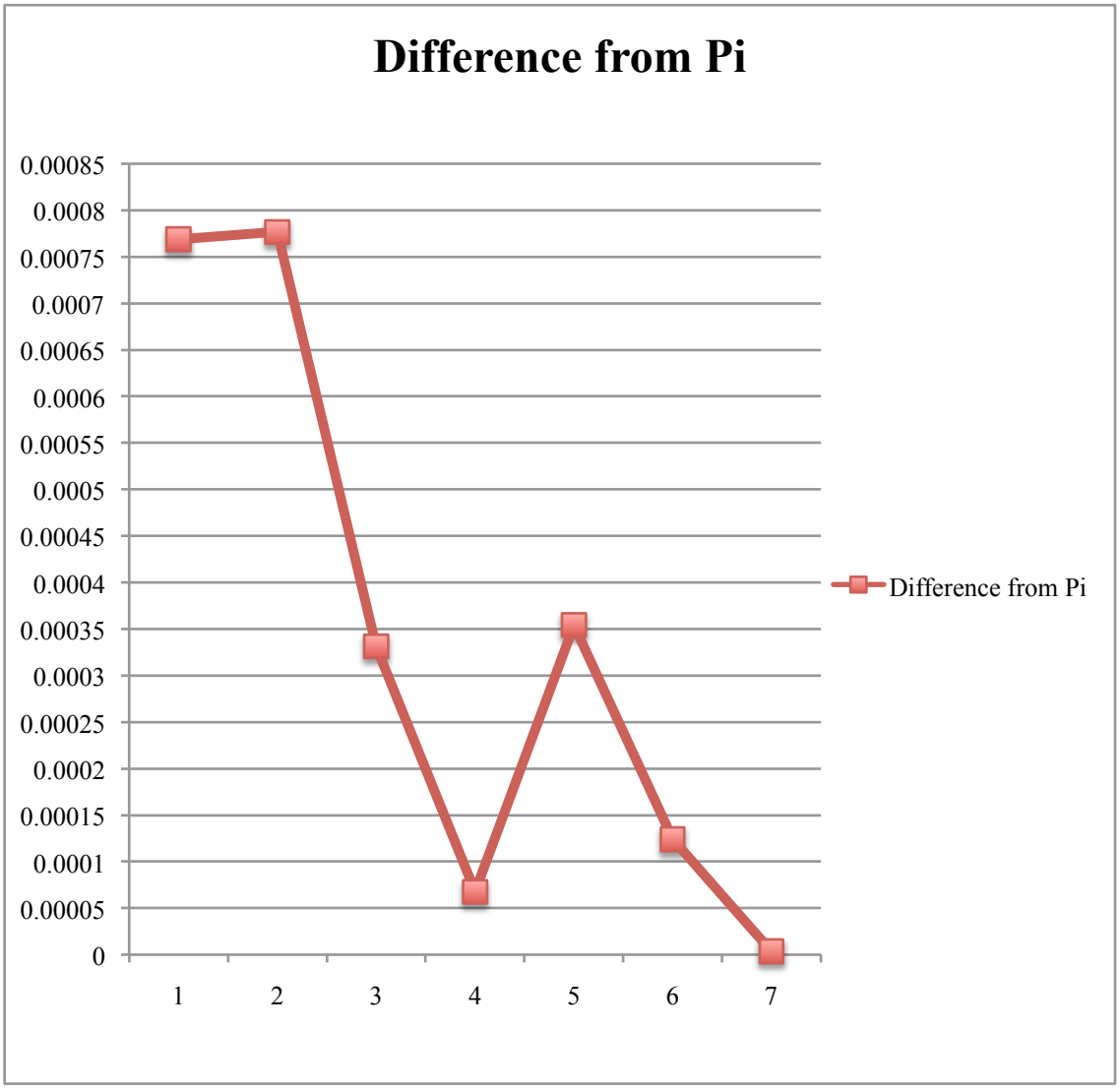

Figure 1.) The difference between seqMonteCarloPi.java's estimated pi and Math.PI. Please note that the X-Axis intervals start with 500,000 samples doubling each time until a total of 32,000,000 samples. The seed value was 103.

The Random Number Generator is a Linear Congruential Generator. The formula is as follows:

nextSt = ((a * curSt) + c) % m)

In this case the value for m is 2147483647. The value of a is 16807 and the value of c is 0. The results in table form are as follows:

# Samples	Difference from Pi
500000	0.000768654
1000000	0.000776654
2000000	0.000331346
4000000	6.76536E-05
8000000	0.000354346
16000000	0.000123904
32000000	3.4714E-06

Java Parallel

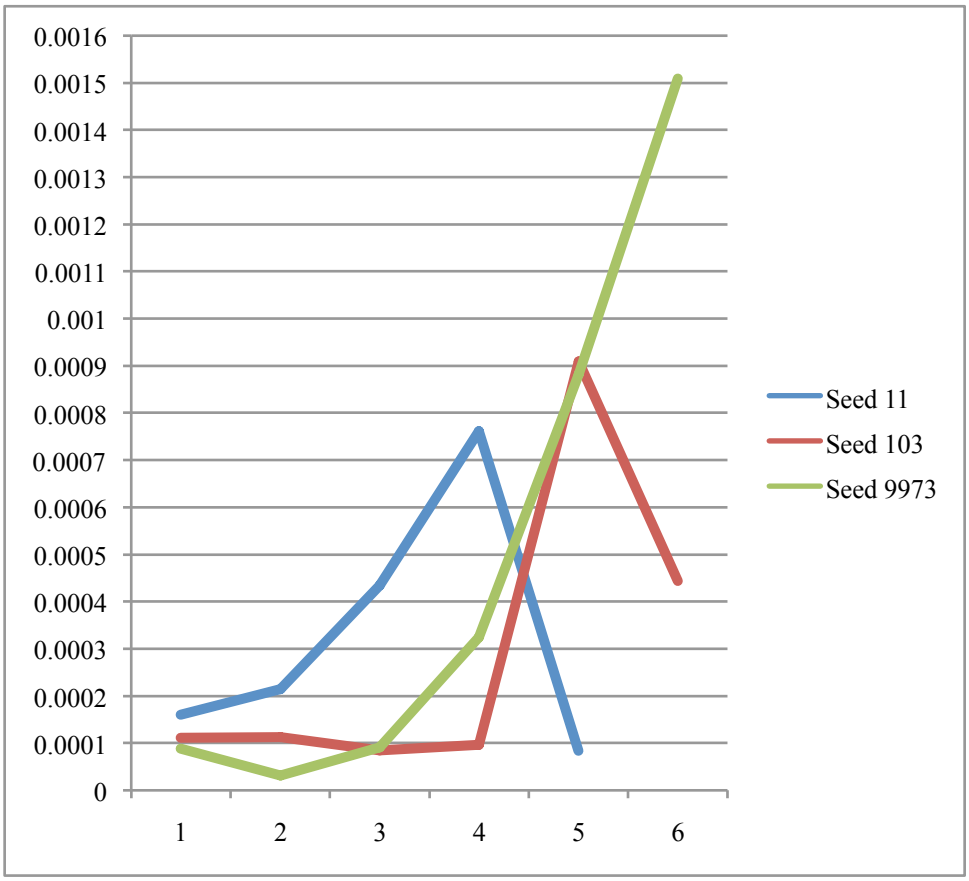

Figure 2) Difference from Math.PI with 32,000,000 samples and the Seeds indicated. Number of threads are indicated along the x-axis in terms of 2 to the N-1th power.

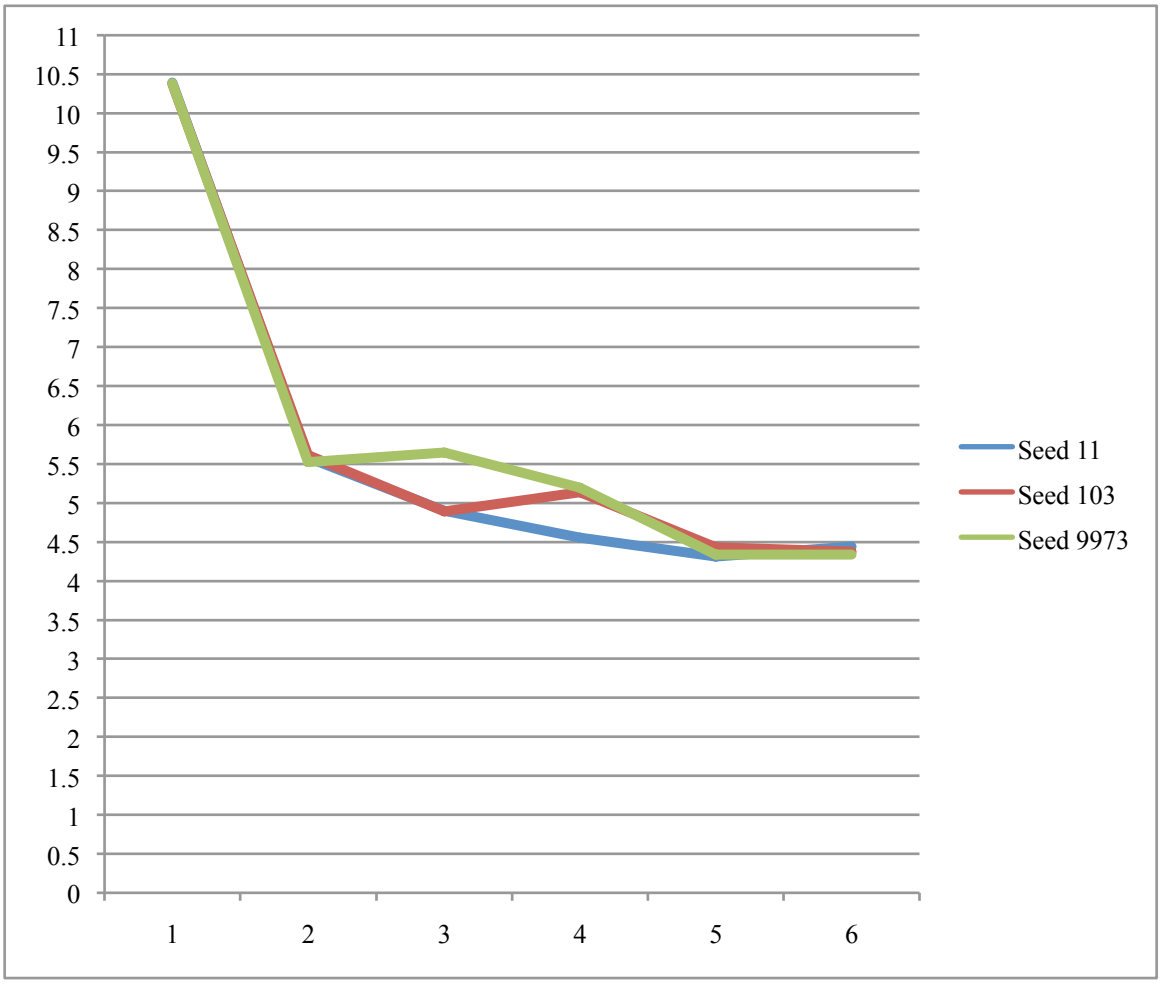

Figure 3) Y-Axis time in seconds. X-Axis number of threads are indicated along the x-axis in terms of 2 to the N-1th power.

Number of Threads	Seed 11	Seed 103	Seed 9973
1	10.394	10.378	10.385
2	5.581	5.616	5.526
4	4.902	4.892	5.647
8	4.552	5.137	5.195
16	4.313	4.43	4.351
32	4.438	4.376	4.338

Table 2) The data used to generate Figure 3.