

Benchmark Calculations Using the Application BigIntegerPi
Timing Comparisons Between a Desktop and Laptop
Calculate the First n Digits of Pi Using the Bailey-Borwein-Plouffe Formula

Using a Big Decimal Package Designed and Implemented by James Pate Williams, Jr.

n	DT	LT
100	0.105	0.292
200	0.362	0.892
300	0.836	2.115
400	1.956	4.990
500	3.432	8.588
600	5.266	13.217
700	8.900	22.304
800	13.380	33.374
900	18.656	46.047
1000	24.444	60.306

Times Are in Seconds

DT = Dell Intel Core i7-6700K CPU @ 4.00 GHz 16.0 GB RAM

LT = Dell AMD A8-7410 APU @ 2.20 GHz 6.00 GB RAM

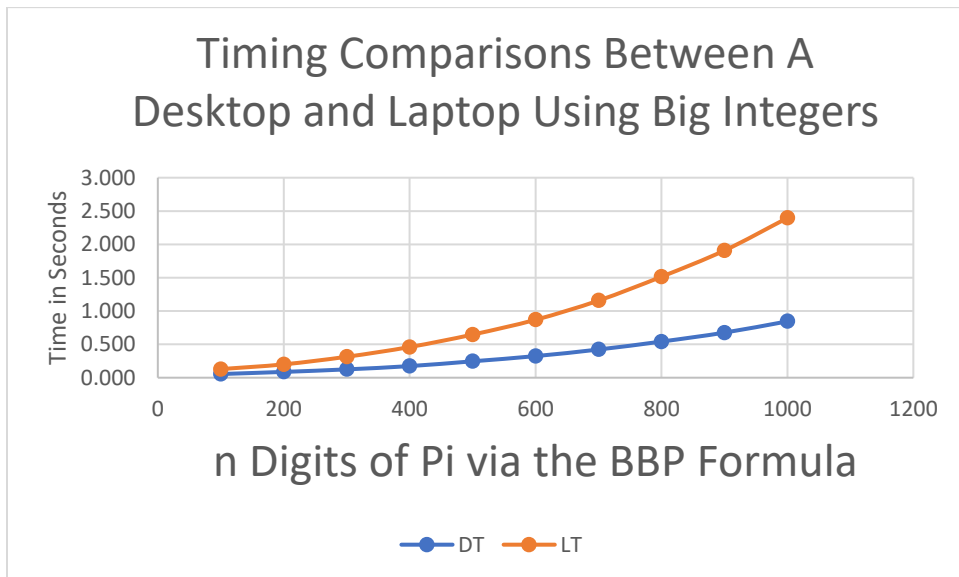
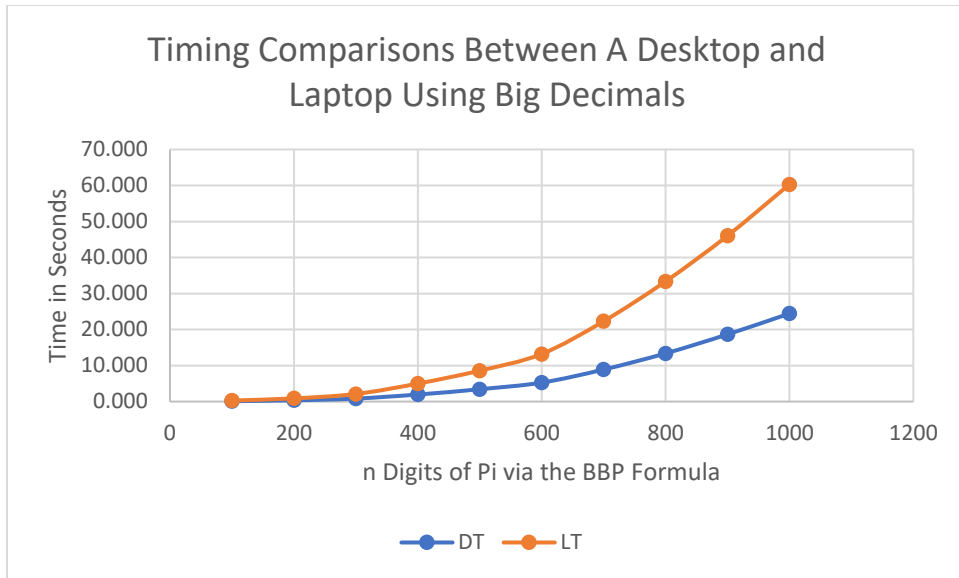
Using the C# Built-in Data Type Big Integer

n	DT	LT
100	0.055	0.129
200	0.087	0.200
300	0.125	0.314
400	0.174	0.460
500	0.246	0.647
600	0.324	0.869
700	0.423	1.157
800	0.542	1.515
900	0.676	1.908
1000	0.845	2.396

Times Are in Seconds

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The BBP formula for the transcendental number pi is as follows:

$$\pi = \sum_{k=0}^{\infty} \left[\frac{1}{16^k} \left(\frac{4}{8k+1} - \frac{2}{8k+4} - \frac{1}{8k+5} - \frac{1}{8k+6} \right) \right]$$

To approximate the first n digits of pi, use the truncated series:

$$\pi = \sum_{k=0}^n \left[\frac{1}{16^k} \left(\frac{4s}{8k+1} \right) - \frac{1}{16^k} \left(\frac{2s}{8k+4} \right) - \frac{1}{16^k} \left(\frac{s}{8k+5} \right) - \frac{1}{16^k} \left(\frac{s}{8k+6} \right) \right]$$

$$s = 10^n$$