- Graph of the 12 datapoints (runtimes):

1. Using a single CPU core with caches enabled:

  The single-precision floating-point function: 1 us

  The double-precision floating-point function: 1 us

  The total execution time of the application: 11 us

2. Using a single CPU core with caches disabled:

  The single-precision floating-point function: 2591401 us

  The double-precision floating-point function: 3485497 us

  The total execution time of the application: 6076919 us

3. Using both CPU cores with caches enabled:

  The single-precision floating-point function: 347481 us

  The double-precision floating-point function: 10 us

  The total execution time of the application: 347481 us

4. Using both CPU cores with caches disabled:

  The single-precision floating-point function: 2591451 us

  The double-precision floating-point function: 20 us

  The total execution time of the application: 2591451 us

/////////////////////////////////

- Performance gained:

1. When working in single core:

(6076919 - 11)/6076919 * 100 % = 99%

2. When working in 2 cores:

(2591451 - 347481)/2591451 = 86.6%

////////////////////////////////

Briefly comment on and discuss any interesting observations you make based on the various execution times you have logged:

If cache is used there is a significant performance increase when using either single cpu core or both cpu cores.

There is more significant increase in sequential (single cpu core) code (99%) and ironically it is faster than the parallel implementation.

///

OUTPUT:

Actual value of pi: 3.14159265400

XIP CTRL REGISTER EN status: 0

Sequential:

Using single-precision floating-point representation: 3.14119005200

Approximate Error: 0.00040268900

Run time of single-precision floating-point function: 2591401

Using double-precision floating-point representation: 3.14158480000

Approximate Error: 0.00000785400

Run time of double-precision floating-point function: 3485497

Run time of sequential code: 6076919

Parallel:

Using single-precision floating-point representation: 3.00000000000

Approximate Error: 0.14159274100

Using double-precision floating-point representation: 3.14158480000

Approximate Error: 0.00000785400

Run time of double-precision floating-point function: 20

Run time of parallel code: 2591451

XIP CTRL REGISTER EN status: 1

Sequential:

Using single-precision floating-point representation: 3.14119005200

Approximate Error: 0.00040268900

Run time of single-precision floating-point function: 1

Using double-precision floating-point representation: 3.14158480000

Approximate Error: 0.00000785400

Run time of double-precision floating-point function: 1

Run time of sequential code: 11

Parallel:

Using single-precision floating-point representation: 3.00000000000

Approximate Error: 0.14159274100

Using double-precision floating-point representation: 3.14158480000

Approximate Error: 0.00000785400

Run time of double-precision floating-point function: 10

Run time of parallel code: 347481