README.txt Page 1

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//
//
          FEDERAL UNIVERSITY OF RIO GRANDE DO NORTE - UFRN
                                                          //
//
                DIGITAL METROPOLIS INSTITUTE - IMD
                                                          //
//
              BACHELOR OF INFORMATION TECHNOLOGY - BTI
//
          SPECIAL TOPICS ON INTERNET OF THINGS "B" - IMD0291
                                                          //
// Names: matrix.h
                                                          //
//
                                                          //
       report.h
//
                                                          //
       report.pdf
       matrix-multiplication-serial.cpp
       matrix-multiplication-serialRand.cpp
       matrix-multiplication-parallel.cpp
       matrix-multiplication-parallel-pthreads.cpp
                                                          //
       calculates-serie-parallel-analysis.cpp
//
                                                          //
                                                          //
//
       shellscript_start.sh
       README.txt
// Date: 16/11/2020
                                                          //
// Version: 1.0
                                                          //
//
                                                          //
// Author: P.R.O.Lima
//
// Repository: https://github.com/r4m0nl1m4/calculates-matrix-multiplicati
                                                          //
//
// Software: GNU Compiler Collection (gcc) 9.3.0
                                                          //
                                                          //
// Description: Calculates the multiplication of two square matrices,
// developed for use on serie and parallel processors with local // interconnections. In each matrix all numbers must be the same and in //
// the same location as the matrix.
                                                          //
//
// To execute:
                                                          //
//
     ~$ bash shellscript_start.sh
                                                          //
//
```

```
/*
  * CPU Report

*/

model name    : Intel(R) Core(TM) i7-4770K CPU @ 3.50GHz
vendor_id    : GenuineIntel
cpu cores    : 4
siblings    : 8
cache size    : 8192 KB
```

```
/*
    * Matrix Multiplication using Serie Process Runtime Report In Seconds
    */

:1.40e-05:1.80e-05:1.20e-05:9.00e-06:2.60e-05
:1.20e-05:2.40e-05:1.70e-05:2.10e-05:1.70e-05
:1.10e-05:1.10e-05:1.60e-05:1.20e-05:1.10e-05
:1.20e-05:2.30e-05:2.00e-05:1.90e-05:2.00e-05
:1.20e-05:1.90e-05:1.60e-05:2.00e-05:2.90e-05
:2.00e-05:1.90e-05:3.00e-05:3.20e-05:1.40e-05
:1.20e-05:1.00e-05:8.00e-06:1.50e-05:2.90e-05
:1.10e-05:1.70e-05:2.20e-05:2.40e-05:2.30e-05
```

```
/*
    * Matrix Multiplication using Line Rand Matrix Serie Runtime Report In Seconds
    */

:1.30e-05:2.10e-05:1.50e-05:1.20e-05:2.10e-05
:1.90e-05:2.80e-05:2.00e-05:2.50e-05:1.80e-05
:1.20e-05:1.50e-05:1.80e-05:1.50e-05:1.60e-05
:1.30e-05:2.20e-05:2.40e-05:2.00e-05:2.40e-05
:2.10e-05:2.10e-05:1.90e-05:1.60e-05:1.70e-05
:2.40e-05:2.40e-05:2.30e-05:2.20e-05:1.80e-05
:1.60e-05:1.30e-05:1.10e-05:1.90e-05:2.10e-05
:1.40e-05:2.10e-05:3.60e-05:2.40e-05:2.80e-05
```

```
/*
   * Matrix Multiplication using Parallel Process (MPI) Runtime Report In Seconds
   */

:4.08e-05:5.03e-05:1.24e-04:4.83e-05:3.92e-05
:5.34e-05:3.06e-05:2.93e-05:3.30e-05:8.12e-05
:8.98e-05:8.55e-05:1.99e-04:1.79e-04:1.77e-04
:1.42e-04:9.61e-05:7.91e-05:9.82e-05:8.10e-05
:1.38e-04:1.20e-04:1.03e-04:1.14e-04:1.08e-04
:1.06e-04:1.91e-04:1.30e-04:1.22e-04:1.14e-04
:1.27e-04:1.98e-04:1.54e-04:1.15e-04:1.13e-04
:1.68e-04:1.62e-04:2.40e-04:1.33e-04:1.96e-04
```

```
/*
   * Matrix Multiplication using Parallel Process (pthreads) Runtime Report In Seconds
   */

:8.04e-04:9.91e-04:6.51e-04:6.34e-04:6.72e-04
:8.45e-04:8.20e-04:5.79e-04:4.77e-04:3.65e-04
:6.75e-04:7.99e-04:3.73e-04:6.03e-04:6.24e-04
:8.27e-04:5.75e-04:1.20e-03:8.69e-04:1.16e-03
:5.87e-04:7.14e-04:1.31e-03:9.39e-04:5.45e-04
:6.08e-04:1.15e-03:5.49e-04:4.50e-04:1.21e-03
:2.10e-03:4.41e-04:6.35e-04:6.03e-04:5.38e-04
:5.21e-04:7.74e-04:7.47e-04:5.68e-04:6.92e-04
```

```
/*
   * Matrix Multiplication using Parallel Process (MPI) Speedup Report
   */

:0.32:0.42:0.12:0.25:0.54
:0.36:0.92:0.68:0.76:0.22
:0.13:0.18:0.09:0.08:0.09
:0.09:0.23:0.30:0.20:0.30
:0.15:0.17:0.18:0.14:0.16
:0.23:0.13:0.18:0.18:0.16
:0.13:0.07:0.07:0.17:0.19
:0.08:0.13:0.15:0.18:0.14
```

```
/*
   * Matrix Multiplication using Parallel Process (pthreads) Speedup Report
   */
:0.02:0.02:0.02:0.02:0.03
:0.02:0.03:0.03:0.05:0.05
:0.02:0.02:0.05:0.02:0.03
:0.02:0.04:0.02:0.02:0.02
:0.04:0.03:0.01:0.02:0.03
:0.04:0.03:0.01:0.02:0.03
:0.01:0.03:0.02:0.04:0.05:0.01
:0.01:0.03:0.03:0.05:0.04:0.04
```

```
/*
   * Matrix Multiplication using Parallel Process (MPI) Efficiency Report
   */

:0.16:0.21:0.06:0.12:0.27
:0.18:0.46:0.34:0.38:0.11
:0.03:0.04:0.02:0.02:0.02
:0.02:0.06:0.07:0.05:0.07
:0.02:0.03:0.03:0.03:0.03
:0.04:0.02:0.03:0.03:0.03
:0.02:0.01:0.02:0.02:0.02
:0.01:0.02:0.02:0.02:0.02
```