```
////////////////////////////////////////////////////////////////////////////
//                                                                        //
//            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                                                          //
//        report.h                                                        //
//        report.pdf                                                      //
//        matrix-multiplication-serial.cpp                                //
//        matrix-multiplication-serialRand.cpp                            //
//        matrix-multiplication-parallel.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/matrix-multiplication         //
//                                                                        //
// Software: GNU Compiler Collection (gcc) 9.3.0                          //
//                                                                        //
////////////////////////////////////////////////////////////////////////////
//                                                                        //
// Description: Calculates  the  multiplication of two square matrices. 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
```

```
/*
 * Problem Size Report
 */

:3:3:3:3:3
:4:4:4:4:4
:3:3:3:3:3
:4:4:4:4:4
:3:3:3:3:3
:4:4:4:4:4
:3:3:3:3:3
:4:4:4:4:4
```

```
/*
 * Serie Runtime Report In Seconds
 */

:1.20e-05:1.40e-05:1.30e-05:1.20e-05:1.30e-05
:1.50e-05:1.20e-05:1.30e-05:2.30e-05:1.60e-05
:1.30e-05:1.20e-05:1.60e-05:1.10e-05:1.30e-05
:1.20e-05:1.90e-05:2.50e-05:2.10e-05:1.40e-05
:1.30e-05:1.40e-05:1.50e-05:6.00e-06:1.00e-05
:1.50e-05:9.00e-06:8.00e-06:1.40e-05:1.40e-05
:1.40e-05:6.00e-06:1.10e-05:1.00e-05:1.30e-05
:1.30e-05:1.80e-05:1.40e-05:1.40e-05:2.00e-05
```

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

:1.64e-04:1.58e-04:1.34e-04:1.47e-04:1.37e-04
:1.31e-04:1.14e-04:1.13e-04:2.20e-04:1.83e-04
:1.34e-04:1.34e-04:1.56e-04:9.70e-05:1.47e-04
:1.05e-04:1.50e-04:2.76e-04:1.65e-04:1.29e-04
:1.42e-04:1.03e-04:2.16e-04:6.50e-05:9.70e-05
:1.62e-04:7.80e-05:1.61e-04:1.34e-04:1.78e-04
:1.27e-04:7.10e-05:1.16e-04:1.24e-04:1.85e-04
:1.20e-04:1.81e-04:1.36e-04:1.17e-04:1.69e-04
```

```
/*
 * Parallel Cores Report
 */

:2:2:2:2:2
:2:2:2:2:2
:4:4:4:4:4
:4:4:4:4:4
:6:6:6:6:6
:6:6:6:6:6
:8:8:8:8:8
:8:8:8:8:8
```

```
/*
 * Parallel Runtime Report In Seconds
 */

:4.56e-05:6.37e-05:3.07e-05:6.38e-05:5.01e-05
:3.21e-05:6.91e-05:3.24e-05:3.13e-05:3.12e-05
:1.17e-04:6.89e-05:1.17e-04:1.65e-04:1.77e-04
:1.04e-04:7.24e-05:7.50e-05:7.00e-05:1.40e-04
:1.62e-04:1.17e-04:1.03e-04:1.12e-04:8.68e-05
:8.64e-05:9.60e-05:9.18e-05:1.37e-04:1.64e-04
:1.53e-04:1.49e-04:1.26e-04:1.42e-04:1.49e-04
:1.60e-04:1.41e-04:1.97e-04:1.62e-04:1.88e-04
```

```
/*
 * Speedup Report
 */

:3.60:2.48:4.36:2.30:2.73
:4.08:1.65:3.49:7.03:5.87
:1.15:1.94:1.33:0.59:0.83
:1.01:2.07:3.68:2.36:0.92
:0.88:0.88:2.10:0.58:1.12
:1.88:0.81:1.75:0.98:1.09
:0.83:0.48:0.92:0.87:1.24
:0.75:1.28:0.69:0.72:0.90
```

```
/*
 * Efficiency Report
 */

:1.80:1.24:2.18:1.15:1.36
:2.04:0.82:1.75:3.52:2.94
:0.29:0.48:0.33:0.15:0.21
:0.25:0.52:0.92:0.59:0.23
:0.15:0.15:0.35:0.10:0.19
:0.31:0.14:0.29:0.16:0.18
:0.10:0.06:0.12:0.11:0.15
:0.09:0.16:0.09:0.09:0.11
```