**Parallel Processing**

**Report**

**Integration of the curve**

**Name: Mariam Ashraf Fekry**

**ID: 20140263**

**Group:CS\_2**

The code used to calculate the integration of a specific curve. In the first takes the function f(x) then the code validates it. Enter interval with 2 values start and end. enter the number of trapezoids. Then the code calculates the approximation of the integration.

the code divides the interval by number of trapezoids and each processor take specific part to calculate the total summation of this area.

The code uses MPICH2 parallel.

this report will show the three functions with three different number of trapezoids.

* F(x)=

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of trapezoids | Analytical solution | Numerical solution | Time | | |
| real | user | system |
| 100 | 48.0000 | 49.207200 | 4.577s | 0.117s | 0.026s |
| 1000 | 48.0000 | 48.084072 | 5.305s | 0.118s | 0.021s |
| 10000 | 48.0000 | 48.013202 | 6.281s | 0.120s | 0.030s |

* F(x)=

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of trapezoids | Analytical solution | Numerical solution | Time | | |
| real | user | system |
| 100 | 1845.333333 | 1845.401600 | 9.654s | 0.144s | 0.025s |
| 1000 | 1845.333333 | 1845.334016 | 11.139s | 0.124s | 0.018s |
| 10000 | 1845.333333 | 1846.331858 | 12.046s | 0.121s | 0.027s |

* F(x)=

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of trapezoids | Analytical solution | Numerical solution | Time | | |
| real | user | system |
| 100 | 1429.333333 | 1429.452800 | 12.369s | 0.118s | 0.029s |
| 1000 | 1429.333333 | 1429.334528 | 11.555s | 0.122s | 0.030s |
| 10000 | 1429.333333 | 1430.187885 | 12.108s | 0.115s | 0.034s |