Chart, line chart, scatter chart

Description automatically generated

The code is estimating the value of pi using a Monte Carlo method with multiple threads. The X-axis represents the thread number and the Y-axis represents the estimated value of pi. Initially, when only one thread is used (Thread No 0), the estimated value of pi is 0, which means that no points were found to lie within the circle. However, as more threads are added, the estimated value of pi becomes closer to the true value of pi (3.14159...). As we can see from the data, when 3 threads were used, the estimated value of pi was 2.667, which is already much closer to the actual value of pi. When 4 threads were used, the estimated value of pi increased to 3, and with 5 threads, it increased to 3.2. Finally, with 6 threads, the estimated value of pi was 3.33, which is even closer to the actual value of pi. This indicates that using multiple threads in a Monte Carlo simulation can significantly improve the accuracy of the estimated value of pi. However, it is important to note that the actual number of threads required to achieve a certain level of accuracy can vary depending on the complexity of the problem and the computational resources available.

Graphical user interface, application, table, Excel

Description automatically generated

Where as if I try big numbers like 100-100000 the value is even getting more closer as it’s shown in the graph. With 100 iterations, the estimation is 2.88 which is relatively close to the actual value. As we continue to increase the number of iterations, the estimation becomes more accurate, reaching a value of 3.14376 with 100000 iterations. This indicates that the estimation becomes more accurate with more iterations, which is expected since the simulation generates more points to better approximate the shape of the circle.