Week-4

1. Implement both Naïve Matrix Multiplication (O(n³)) and Strassen’s Matrix Multiplication (O(n^2.81)).Compare their execution times for different input sizes (e.g., n = 64, 128, 256, 512). [5m]

2. Implement Strassen’s Matrix Multiplication to optimize matrix operations in machine learning, where training large neural networks requires frequent multiplication of weight matrices with input data; compare the performance of Strassen’s algorithm with naive multiplication by testing on square matrices of different sizes (64×64, 128×128, 256×256, 512×512), record execution times, and plot a graph of matrix size versus execution time to illustrate how Strassen’s O(n^2.81) algorithm scales better than the naive O(n^3) approach for computationally heavy ML workloads. [5m]