# Analyze Results:

* Compare execution times across:
  + Matrix sizes.
  + CPU Core configurations.
  + Machines (hardware and virtual).
* Identify and discuss trends and anomalies.

Machine 1 (MacOS – Desktop, M3):

Machine 2 (MacOS – Laptop, M3 Max):

Machine 3 (Windows Intel, i7):

Machine 3a (Windows Intel, i7, Windows Virtual Machine):

# Parameter Experimentation:

*Modify the matrix sizes and the number of CPU cores for parallel execution to explore their impact on execution times.*

In addition to modifying matrix sizes and CPU cores parameters, I also ran this script across 3 separate machines with differing generations of technology.

# Discussion:

*Present clear and organized results using generated plots, tables, and text.*

*Discuss any insights gained from the experiments, emphasizing the potential benefits of parallel programming in reducing execution times while acknowledging that parallel programming may not always lead to improved performance.*

## Objectives:

Compare execution times for matrix multiplication across:

* Hardware platforms: M3, M3 Max, Intel i7, Intel i7 VM.
* CPU Cores Used: Test with varying numbers of cores (default: 1, 2, 4, 8)
* Matrix Sizes: Test with small to large matrix sizes.

Hypothesis:

1. M3 Max will likely outperform M3 due to higher performance cores.
2. Intel i7 (physical) will outperform the virtual machine due to nested processes from virtualization.
3. Larger matrices will show more significant benefits from parallel execution.

## Methodology:

1. Create CS270\_CourseProject github repository to sync project script and data across the various machine platforms.
2. Review script to verify understanding of process executions.
3. Verify script can run without error across all platforms and ensure environment package conflicts are resolved.
4. Run test executions across all 4 platforms and perform initial analysis to verify script behavior is varied.
5. Add basic logging functionalities.
6. Export results from each machine and complete report requirements.

## Code Used:

# Conclusion:

*Reflect on the significance of findings and how they relate to the concepts of parallel programming.*

*Summarize key takeaways and implications of my experiment. Consider areas for further investigation or optimization. Submit both pdf document and .ipynb to canvas.*