Lab 07 – Microprocessor Systems

# Graph of Datapoints

Chart, bar chart

Description automatically generated

Figure 1 – Graph of Datapoints from Lab07

# Performance Calculations

Single Core, Single Precision, Performance Increase:

Single Core, Double Precision, Performance Increase:

Single Core, Application, Performance Increase:

Double Core, Single Precision, Performance Increase:

Double Core, Double Precision, Performance Increase:

Double Core, Application, Performance Increase:

# Observations and Discussion

From the graph, it is clear that without cache, the processes run much slower than with cache. This makes sense, as using cache allows the Pi Pico to quickly store data and read data it is currently using. Without cache, all the data it is using is being stored in permanent memory, which is very slow.

This is evident in the calculated performance values for the processes, as there is, on average, an 85% increase in performance when changing from no cache to cache.

From the graph, it is also evident that, as with Lab 06, the use of multi-core improves the runtime performance of the processes, both when using cache and when not using cache.