Project Proposal

Problem Description
In this project, we will conduct an experiment that tests the performance difference between three different generations of MacBook Pros, in order to evaluate performance gains year-to-year based off of MSRP. This will test an Intel MacBook Pro on the last Intel based Architecture before the transition to ARM and the ARM based architectures of the two most recent iterations of MacBook Pros (M1 & M1 Pro). Companies often tout increased performance over the previous year's model and use competitor benchmarks(usually with a general caption of a competitor's specs) to entice consumers to buy. In the case of Apple, the increased gains have been touted to increase by a significant margin with the switch from Intel to Arm based architectures. The aim of this project is to test the performance of each generation of Macbook Pro using an established benchmark tool. This will provide valuable information when performing cost-benefit analysis due to the high price tag of MacBook Pros. Apple has used nearly every opportunity it gets to entice consumers to buy in and support the transition from Intel to ARM with graphs that depict enormous performance increases year over year.We expect the ARM variants of the MacBook Pro to soundly beat the Intel variant of the MacBook Pro by a wide margin, but we also expect to see lower year-over-year performance increases moving from M1 to M1 Pro models.

Methodology

The specifications of the 3 generations of MacBook Pros used in this project are listed below:
All 3 MacBook Pros listed below are also the base configuration for each of the respective release years.

Year	Architecture	Operating System	Processor	CPU Core Count	RAM(gb)
2019	x86	MacOS Monterey	8th Gen Intel Core I5	4	8
2020	ARM	MacOS Monterey	M1	8	8
2021	ARM	MacOS Monterey	M1 Pro	10	16

Table 1: Specifications of the tested MacBook Pros

To assess the performance of the three MacBook Pros, the following benchmarks will be used: quicksort, ranksort, LINPACK. Each system will run the benchmarks, and their execution time will be recorded.

Deliverables
In class presentation - A organized slideshow containing the key points of the report and to show the collected data.

Report - A detailed paper providing the information of the tested computers, performance data, and an analysis on said collected data.

Team

Robert Bonham

Role & Responsibilities:

Test the performance on the 2020 MacBook Pro configuration listed in the methodology section.

Carson Holland

Role & Responsibilities:

Organize collected data into tables and graphs, creating the presentation, as listed in the deliverables section.

Christopher Le

Role & Responsibilities:

Test performance on the 2019 & 2021 MacBook Pro configurations listed in the methodology section.