

For this homework you will write a response and upload your pdf result. Responses can be handwritten or typed but you will need to make sure to run a pdf conversion on either. For hand written submissions, you will get the best result by using black ink on white paper and placing the sheet on a flat surface before using your phone to take a picture. From there you should be able to convert to pdf with an app if it is not built in already. For typed responses using Microsoft Word (all students get this for free via [IS](#)) you can simply do a **save as** and then pick pdf. [Moodle](#) allows TAs and your instructor to view the pdf rendering without downloading which is an efficient way to grade and provide feedback. Each response should be a paragraph at minimum (3-5 sentences).

[Preface] One aspect that we would like to grow is our understanding of computing hardware. In this assignment, we are very interested about the specifications of different forms of computational devices. A computational device will have the CPU (control processing unit), RAM (Random Access Memory which is volatile), Storage (usually SSD or Flash based that is much larger than RAM and is non-volatile meaning it keeps or stores the data during power off). All of this follows from the computational model we covered in CH1 of your text.

For the CPU we want to know if it is a 64-bit processor (they usually are now), how many cores (usually 4 or more now), and how fast it is (in GHz or billions of cycles per second), for RAM we want to know the capacity (in GB) and the speed (DDR5 is 4800 MHz or 4.8 GHz), for storage we want to know the size in (TB or trillions of bytes). A GPU is a graphics processing unit and there may be other special-use processors such as the Neural Engine. A good way to get some additional information about a chip (processor) is to search for a Wikipedia page on it such as the new A16 chip. The apple page has very limited information but a wiki search will provide the detail that this assignment requires: https://en.wikipedia.org/wiki/Apple_A16

[1 20pts] Research the hardware specifications for your current phone.

My current phone is an iPhone 15 Pro. It has an Apple A17 Pro CPU, which is a 3nm 64-bit ARM-based SoC. It has 6 cores (4 efficiency, 2 performance) and 19 billion transistors. Its maximum CPU clock rate is 3.78 GHZ. Its GPU is an Apple-designed 6-core GPU with a 16-core neural engine, which can perform 35 trillion operations per second and supports ray tracing. It has 8GB of LPDDR5 (3.70GHz) RAM. It has 128GB of built-in storage.

My resource for information: https://en.wikipedia.org/wiki/Apple_A17

[2 20pts] Research the hardware specifications for your next phone (dream phone).

Because I bought my phone last month, I currently have my dream phone. I'd like to respond with my previous phone to this question. My old phone is an iPhone 12 Pro Max. It has an Apple A14 Bionic CPU, which is a 5nm 64-bit ARM-based SoC. It has 6 cores (4 efficiency "little," 2 performance "big") and has 11.8 billion transistors. Its maximum CPU clock rate is 3.1 GHZ. Its GPU is an Apple-designed 4-core GPU that has a 16-core neural engine, which can perform 11 trillion operations per second. It has 6GB of LPDDR4X (2750MHz) RAM. Finally, it has 128GB of built-in storage.

My resource for information: https://en.wikipedia.org/wiki/Apple_A14

[3 20pts] Research the hardware specifications for your current laptop/desktop.

My current laptop is the 2023 14-inch MacBook Pro. It has an M2 Max CPU which is a 5nm 64-bit ARM-based SoC. It has 12 cores (8 performance + 4 efficiency) and has 67 billion transistors. Its maximum CPU clock rate is 3.49 GHz. It has an integrated GPU, which has 30 cores, and a 16-core neural engine. It has 32GB of LPDDR5 RAM, which has 400GB/s bandwidth. Lastly, it has 1TB of built-in storage.

My resource for information: https://en.wikipedia.org/wiki/Apple_M2

[4 20pts] Research the hardware specifications for your dream laptop/desktop.

My dream computer is the M2 Ultra Mac Studio. It has an M2 Ultra CPU which is a 5nm 64-bit ARM-based SoC. The CPU has 24 cores (16 performance + 8 efficiency) and has 134 billion transistors. Its maximum CPU clock rate is 3.49 GHz. It has an integrated GPU, which has 76 cores, and a 32-core neural engine. It has 192GB of LPDDR5 RAM, which has 800GB/s bandwidth. It also has 8TB of built-in storage.

My resource for information: https://en.wikipedia.org/wiki/Apple_M2

[5 20pts] research another computational device specification (XBOX, PS, Quest, Apple AR, etc)

The other computational device I picked is the PlayStation 5. It has a custom 8-core AMD Zen 2 CPU, which is a 7nm 64-bit SoC (It also supports 32 and 16-bit operations). The CPU has a variable frequency of up to 3.5GHz and has 8 cores and 16 threads. Its GPU is a custom AMD RDNA 2-based graphics engine (10.28 Teraflops) that has 36 compute units which supports up to 2.23 GHz and has hardware-accelerated ray tracing. It has a 16GB GDDR6 RAM which supports 448GB/s bandwidth. Lastly, it has 825GB of built-in storage.

My resource for information: https://en.wikipedia.org/wiki/PlayStation_5

<https://www.androidauthority.com/ps5-specs-1133031/>