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IntroCS pd5
i0lab1
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01. ***Flight Simulator:*** *Hikaru is a former pilot who spends many hours on Microsoft Flight Simulator. She is currently running Microsoft FS2019 on her computer, but it is sloooow. Microsoft just announced FS2020 will be released in March 2020, and Hikaru wants you to design a computer to run FS2020 seamlessly.*

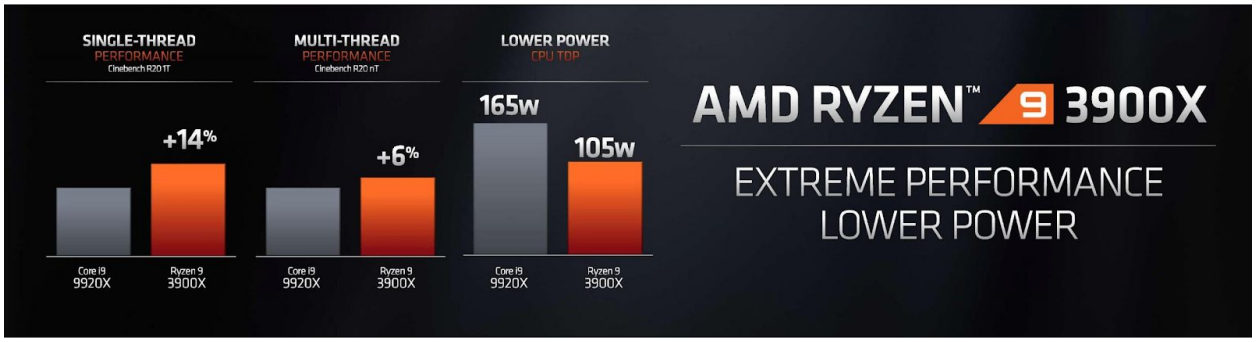
Background/Guidelines: *Hikaru does not want to spend more than $3000. This includes peripherals, but not software.*

Total Cost: ***$2780.56***

The multi-core processor maximizes both speed and efficiency while the CPU cooler works quietly behind the scenes to cool important components of the PC in order to avoid crashes/freezes when the flight simulator is running. Because the machine contains a great amount of memory space, storage is not a concern. The graphics card works with the monitor to create visually appealing displays, and the keyboard and mouse, designed specifically for gaming, will allow you to maneuver through the game easily. This machine is equipped with speakers to amplify the real-world sounds the software simulates, and the case has a sleek, elegant design. All in all, the computer is made of components chosen for their high performance level in addition to their affordability.

CPU: **AMD Ryzen 9 3900X 3.8 GHz 12-Core Processor ($434.00)**

The Central Processing Unit, or CPU for short, is a crucial component in operating Flight Simulators as the performance is directly related to how efficiently the CPU functions. The AMD Ryzen 9 3900X model provides a clock speed of 3.8 GHz and a turbo speed of 4.6GHz which is considered to be a good high-speed range. Its multi-core processor allows twelve cores to work together and execute instructions or separately to perform multiple operations at once. In other words, it is the equivalent of having several “brains.” The CPU also features 24 threads, allowing for multiple tasks to be performed at the same time.



CPU Cooler: **Cooler Master Hyper 212 RGB Black Edition 57.3 CFM CPU Cooler (($44.00)**

A CPU cooler prevents important computer components from overheating and extends the lifetime of the hardware by maintaining a constant temperature at all times. In order for the flight simulator to function smoothly without any crashes or freezes, it is necessary that the CPU cooler removes all excess heat generated by the CPU when the software is running. The Cooler Master Hyper utilizes four heat pipes to absorb and release heat into the heatsink as two fans work to extract the heat out as efficiently as possible. The noise level is 26.0 decibels which is considered to be faint and comparable to that of a whisper. For its performance, the cooler is at a very reasonable price point.

Motherboard: **Asus TUF Gaming X570-Plus (Wi-Fi) ATX AM4 Motherboard ($189.99)**

The motherboard is a type of internal hardware that connects many other internal hardware components in a computer such as RAM and controls equipment like the console and mouse. There are numerous slots or connection points wires can be placed to assist the internal components such that they function together smoothly. The Asus TUF Gaming X570-Plus includes Wi-Fi despite its relatively low price point and has an equally strong heatsink to that of other higher-end Asus X570 motherboards. A heatsink is a device for absorbing excessive heat.

RAM: **Corsair Vengeance LPX 16 GB (1 x 16 GB) DDR4-3000 Memory ($74.99)**

Random-Access Memory, or RAM for short, is the computer's short term memory. It is quickly accessible and temporarily stores all data until the computer is turned off which is essential for processing information. The Corsair Vengeance LPX can store 16 GB of memory and is designed for high-performance overclocking. The pure aluminum heat spreader and eight-layer PCB allows for faster heat dissipation and control. PCB stands for "Process Control Block" which is a data structure in a system kernel that stores data about a process.

HDD: **Seagate Barracuda Compute 2 TB 3.5" 7200RPM Internal Hard Drive ($50.99)**

Hard Disk Drive, or HDD for short, is a memory hardware device that manages the positioning, reading, and writing of the hard disk that supplies data storage. The Seagate Barracuda Compute can hold up to 2 TB of storage which is considerably large for such a low price point.

PSU: **Corsair RM (2019) 750 W 80+ Gold Certified Fully-Modular ATX Power Supply ($124.99)**
Power Supply Unit, or PSU for short, is the component that supplies power to the computer. From a standard electrical outlet, it pulls the required amount of electricity and converts the AC current to DC current. The Corsair RM is reliable and offers a great power supply due to its modular system. The 750 watts also make it suitable for future upgrades.

Case: **NZXT H510 AYX Mid Tower Case ($69.99)**
The case is the enclosure that contains the majority of the components that make up a computer. The NZXT H510 offers a clean black and white aesthetic and is also fairly easy to work with plenty of space for cable management in its extension sleeves.

Software: **Microsoft FS2020**
The flight simulator is the software that will be used by Hikaru. It can be used in Microsoft Windows operating systems.

OS: **Microsoft Windows 10 Pro OEM 64-bit ($139.99)**
Operating System, or OS for short, is the software that communicates the computer's binary language into one that we can understand such as a GUI, or Graphical User Interface. It manages the majority of components of a computer including hardware, memory, processing, etc. The Microsoft Windows 10 Pro

Network: **Gigabyte GC-WB867D-I PCIe x1 802.11a/b/g/n/ac Wi-Fi Adapter ($32.66)**
The network is composed of multiple devices that communicate with each other. The Gigabyte GC-WB867D-I includes dual band Wifi and Bluetooth and performs well in terms of both speed and range for its price.

Graphics: **MSI GeForce RTX 2080 Ti 11 GB Gaming x Trio Video Card ($1194.00)**
The MSI GeForce RTX brings realistic 2D and 3D effects to the screen and allows the user to observe visually. It contains a core

clock of 1350MHz and high boost clock at 1755MHz, offering it a great processing speed and maximizing the computer display's frame rate. Additionally, the graphics card itself contains three built in cooling fans, accelerating the cooling speed of the hardware.

Monitor: **Asus VG248QE 24.0" 1920x1080 144 Hz Monitor ($249.99)**
Considering that this is a flight simulator, the screen size should be large in order to provide the user with a full viewing experience. Along with its 24-inch screen, the monitor also boasts a 1920 x 1080 resolution, allowing for a high quality display.

Keyboard: **Logitech G910 Orion Spark Wired Gaming Keyboard ($104.99)**
The Logitech G910 Orion Spark Wired Gaming Keyboard is designed for gaming. It has concave keycaps and several macro buttons that are programmable, allowing for an overall faster response. The keyboard also has customizable color options.

Mouse: **Logitech G502 HERO ($46.99)**
The Logitech G502 HERO is specially designed for gaming. It has eleven customizable buttons, five of which can be assigned different commands which act as efficient shortcuts. In addition, the mouse has a gaming speed of up to 16000 DPI. As the DPI increases, the mouse becomes more sensitive to the user's movements, allowing them to choose a gaming speed from this range to suit their gaming needs.

Speakers: **Logitech Z200 0 nW 2.0 Channel Speakers ($22.99)**
These speakers can be used to amplify the sounds from the flight simulator's soundscape. For example, the simulator can imitate weather sounds.