# Ahmad Ali Ahmad Othman - Section 1 - Assignment 1

### 1. **CPU (Processor)**: **AMD Ryzen 5 5600X**

* **Reason**: The Ryzen 5 5600X is a 6-core, 12-thread processor, which offers excellent gaming performance. It’s affordable and can handle both gaming and light content creation tasks like video editing.
* **Function**: The CPU is the brain of the computer, executing instructions for everything from running the game engine to controlling player inputs. The Ryzen 5’s core count is ideal for today’s games, which are optimized for multi-core processors.
* [Product Link](https://computecheg.com/en/product/cpu-amd-ryzen-5-5600/?gad_source=1&gclid=CjwKCAjwyfe4BhAWEiwAkIL8sKKjciV60X0kvFO4wlexO99gQQs4flPf4ETHG739L3pbuxZ15jx4XhoCELYQAvD_BwE)

### 2. **GPU (Graphics Card)**: **NVIDIA GeForce RTX 3060**

* **Reason**: The RTX 3060 provides smooth gameplay at 1080p and 1440p, and it supports NVIDIA’s ray tracing and DLSS technologies, which improve visual fidelity and performance. It’s a well-rounded choice for a gaming-focused build without overspending.
* **Function**: The GPU handles the graphical computations needed to render games. It processes graphics and outputs them to your display. The RTX 3060 is well-equipped for popular games at high settings, and its ray tracing support enhances graphics realism.
* [Product Link](https://www.sigma-computer.com/item?id=2826)

### 3. **Motherboard**: **MSI B450 Tomahawk Max**

* **Reason**: This B450 motherboard is affordable yet has all the essential features needed for gaming, including good VRMs for CPU stability, multiple expansion slots, and support for fast RAM. It also supports Ryzen processors, so it pairs well with the Ryzen 5 5600X.
* **Function**: The motherboard connects all your components together and allows them to communicate. This particular model provides room for upgrades, allowing you to swap out parts like the CPU and RAM down the line.
* [Product Link](https://www.sigma-computer.com/item?id=1115)

### 4. **RAM (Memory)**: **Corsair Vengeance LPX 16GB (2x8GB) DDR4-3200**

* **Reason**: 16GB is the sweet spot for modern gaming, and the 3200 MHz speed is optimal for Ryzen processors. The dual-channel setup (2x8GB) also improves performance compared to a single 16GB stick.
* **Function**: RAM is a short-term memory where data needed by the CPU and GPU is temporarily stored. Faster RAM improves the efficiency of data transfer, which translates to smoother gameplay, especially in games that are memory-intensive.
* [Product Link](https://www.sigma-computer.com/item?id=1527)

### 5. **Storage**: **Crucial P3 1TB NVMe SSD**

* **Reason**: The Crucial P3 is a fast NVMe SSD with ample space for both your OS and games. NVMe drives have much faster read/write speeds compared to traditional hard drives and even SATA SSDs, making load times noticeably faster.
* **Function**: Storage is where your data is kept. An NVMe SSD like this one significantly reduces game loading times, enhances system boot-up speed, and makes the overall experience snappier than traditional storage.
* [Product Link](https://www.sigma-computer.com/item?id=4917&name=Crucial_P3_1TB_M.2_PCIe_Gen3_NVMe_Internal_SSD_-_Up_to_3500MB/s)

### 6. **Power Supply Unit (PSU)**: **EVGA 600 W1, 80+ White 600W**

* **Reason**: This 600W PSU provides enough power for all the components, with a bit of headroom for future upgrades. It’s 80+ White certified, ensuring efficient power delivery without generating excessive heat.
* **Function**: The PSU converts electricity from the wall into a form your computer can use and distributes it to all the components. A good PSU is essential for system stability and prevents potential damage from power surges.
* [Product Link](https://www.amazon.com/EVGA-Certified-100-W1-0600-K1-Power-Supply/dp/B0160XJAQK)

### 7. **Case**: **NZXT H510**

* **Reason**: The NZXT H510 has good airflow, is easy to build in, and has a minimalist design. It also comes with two pre-installed fans, saving additional costs on cooling.
* **Function**: The case houses all components and keeps them cool and protected. Good airflow is essential for maintaining stable temperatures, which prolongs the lifespan of your components and ensures they run efficiently.
* [Product Link](https://sigma-computer.com/item?id=2605)

### 8. **CPU Cooler (Optional)**: **Cooler Master Hyper 212**

* **Reason**: The Ryzen 5 5600X does come with a stock cooler, but the Hyper 212 provides better cooling, which is useful for those who want to keep temperatures low or plan to overclock their CPU.
* **Function**: A cooler removes heat from the CPU to keep it operating at optimal temperatures. A more efficient cooler like the Hyper 212 can help the CPU maintain high performance under load, especially in gaming.
* [Product Link](https://www.sigma-computer.com/item?id=1728)

### **Assembly Instructions**

1. **Prepare the Case:** Open up the case, and make sure all screws and accessories are ready.
2. **Install the CPU:** Open the motherboard’s CPU socket latch, carefully align the CPU and slot it in without pressing down. Close the latch.
3. **Install the CPU Cooler:** Attach the cooler to the motherboard on top of the CPU with the provided brackets and thermal paste if necessary. Plug it into the motherboard’s CPU fan header.
4. **Insert RAM:** Insert the RAM sticks into the appropriate slots. Make sure they click into place.
5. **Install Storage:** Mount the NVMe SSD directly onto the motherboard in the designated M.2 slot. For the HDD, secure it to the drive bays in the case and connect it to the motherboard.
6. **Mount the Motherboard in the Case:** Secure the motherboard with screws, aligning it with the case’s standoff points.
7. **Install GPU:** Insert the GPU into the PCIe slot, secure it with screws, and connect the power cables.
8. **Connect the PSU:** Plug the PSU into the motherboard (24-pin and 8-pin connectors), GPU, storage devices, and any case fans.
9. **Cable Management:** Route cables neatly to ensure good airflow and close up the case.
10. **Boot and Install OS:** Once assembled, power up and enter the BIOS to confirm all parts are detected. Then install your operating system.

### **Total Estimated Cost**: Around $700 (34,000 L.E) - $800 (39,000 L.E)

This build is designed to handle most games at high settings on a 1080p or even 1440p monitor, providing a smooth gaming experience without unnecessary overspending. Each component has been chosen to allow for future upgrades, meaning you can replace parts as your budget allows to keep this build performing well for years.