PC Assembly

PART A: Tools used

1.0 Screwdriver

(Figure 1.0: A standard screwdriver)

A screwdriver is essential to the task of assembling computer parts. Usually a + size 1.5 would get the job done. The function of the screw would be to tighten the screws that secure the different components in place.

2.0 Thermal Paste

(Figure 2.0: MX-Thermal paste)

Thermal paste is essential to computer assembly. The function of a thermal paste is to be applied on top of the processor (more specifically between the heat sink and the processor to facilitate efficient heat transfer from the processor to the heat sink. Not applying it would result in excessive over heating for the processor.

3.0 Anti-static wrist band if available

(Figure 3: Anti-static wrist band)

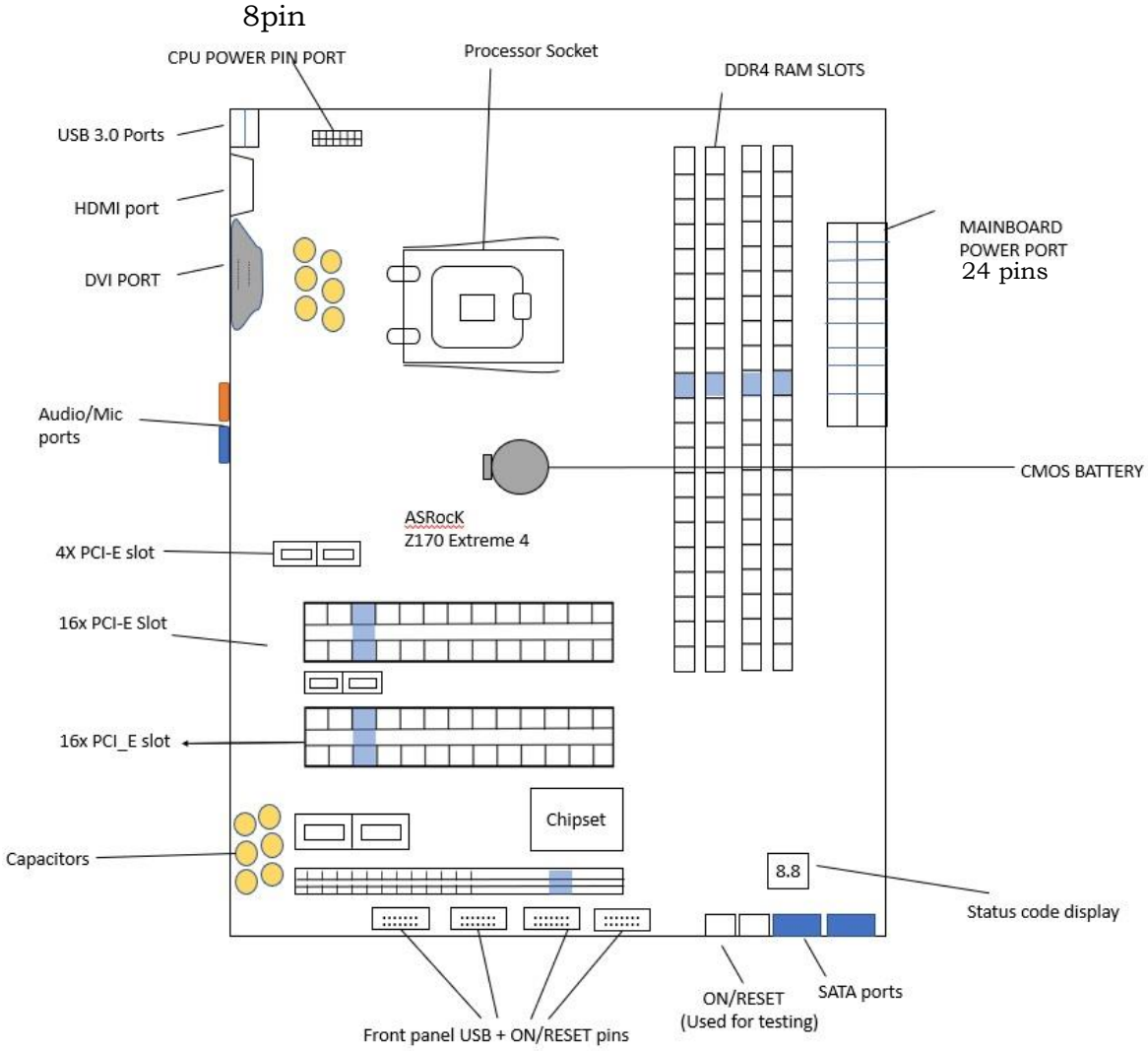
The anti-static wrist band is optional and if not available, simply touching your power supply while not wearing socks would do the same task which is eliminating static Electric charge which can be very harmful to components in the pc.

4.0 A 3.0 USB drive (8GB minimum)

(Figure 4: A SanDisk 8GB drive as an example)

A USB drive will be used too install the operating system into the assembled computer. The 3.0 generation helps given their high read/write performance.

PART B: Motherboard diagram:



Note that motherboards are different and in our case we are using the ASrock z170 Extreme ATX motherboard.

PART 3: STEPS TOWARDS ASEMBLING A COMPUTER

STEP1:

Eleminate static charge:

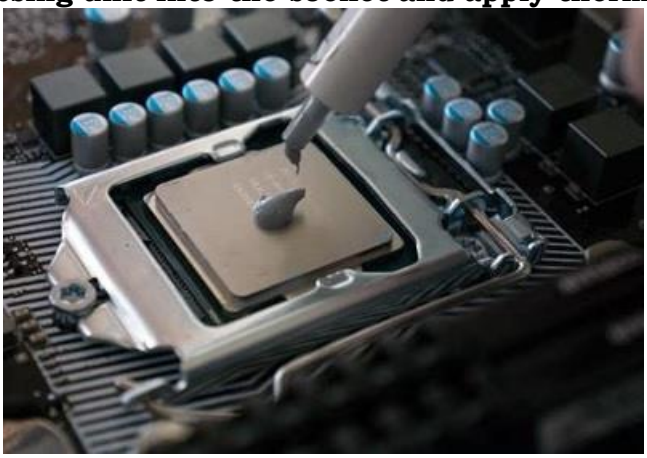
This can be done by touching the power supply or the case with your bare hand.Avoid wearing socks and or having wet hands.

Also for your safety ensure that the main power cable is not connected to the power supply.

Ensuring that all the required material is available is a very important step, since missing an item as simple as thermal paste could result in catastrophic damage to the processor given that it does not transfer the heat properly to the heat sink which wont be able to dessipate the resultant heat fast enough from our processor.

Step 2:

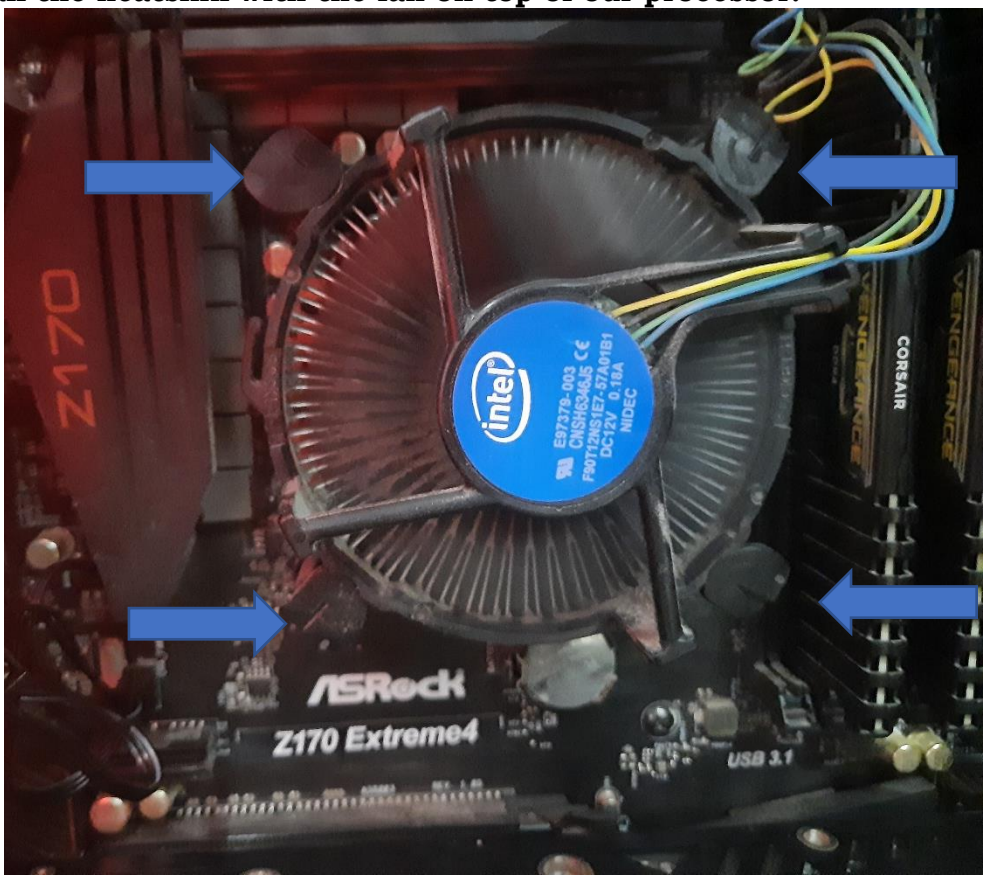
Insert the processing unit into the socket and apply thermal paste.



A processor is the brain of a computer, its responsible for data processing. In this build we are using a multicore i5 6500 intel processor.

STEP3:

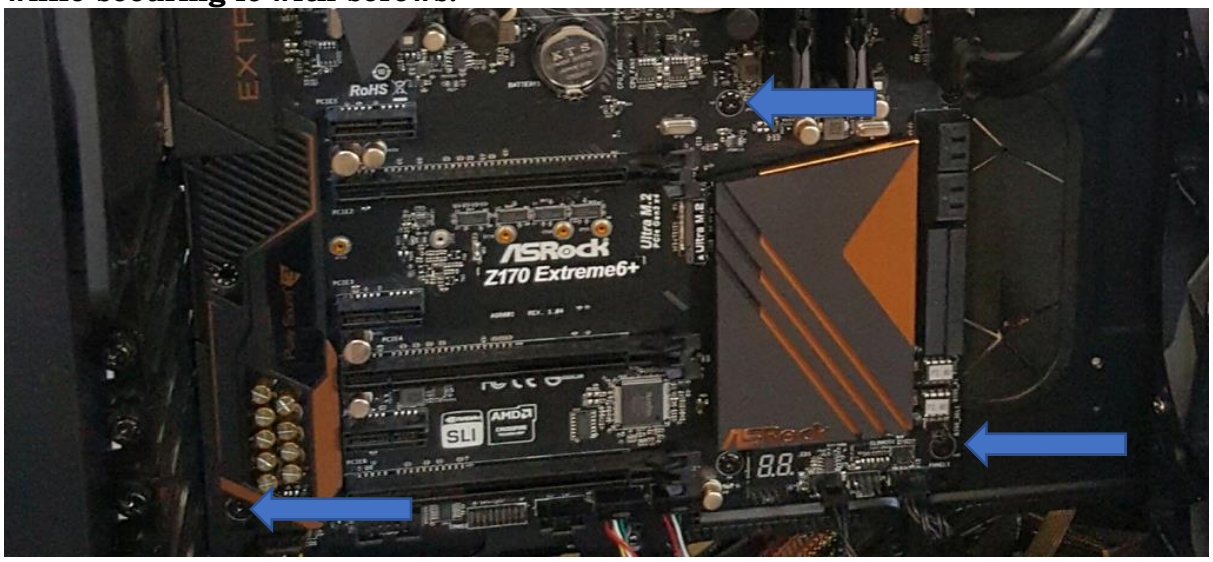
Install the heatsink with the fan on top of our processor.



(Figure: Secure the four corners with the twisting mechanisim.)

STEP 4:

Install the IO shield into case and Insert the motherboard into the case while securing it with screws.



In our build we are using Asrock Z170 extreme Motherboard.

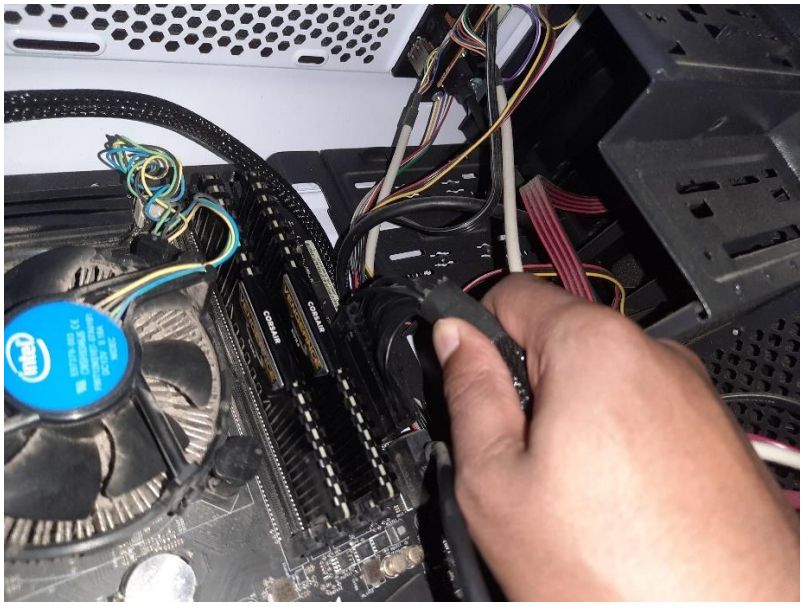
STEP 5:

Isntall power supply and connect the 24 pin connectior for motherboard as well as the 6 or 12 pin connector

Please note that this could vary based on theprocessor and motherboard used. for the power supply.We are using a corsair CX750M non modular power supply.

(Figure: insert the power supply into the case)

Secure the 4 screws at the back of the case to hold power supply in place.Ensure the power switch from the outlet is off before connecting the power supply.



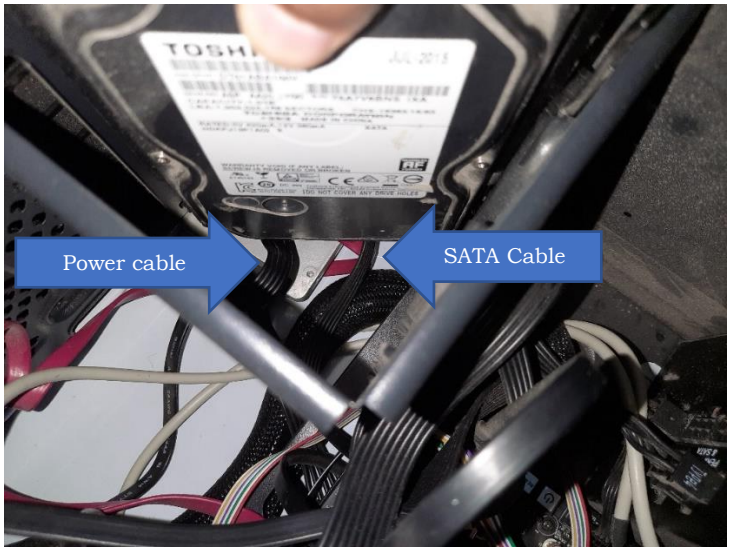
(Figure: Connecting the 24pin connector to the motherboard.This provides power to the main board.)

(Figure: Connecting the 4pin connector to the motherboard.These 4 pins provide the processor with power.)

Overall, A power supply Provides direct current to computers. It does this by converting the AC current we get from the wall outlet. When selecting one ensure that the wattage it provides is enough to run all your devices. Failing to do so would result in your power supply becoming a fire hazard.

STEP 6:

Install your Hard drive and or SSD (depending on your desired storage) and connect the sata and power cables to them.



(Figure: inserting and securing hard drive into tray)

A hard drive is a secondary storage unit with a rotating magnetic plate that can hold / store data even after the system is shutoff. Size wise, this unit can hold

about 1 terabytes of storage. Ensure to connect the sata cables and the power at the back of the storage unit.
We will be using two types in this pc assembly which are Hard disks given their low cost per storage ratio and a solid-state drive (SSD) which we would install the operating system on for fastest performance.

STEP 7:

Install the ram modules into their slots.

(Figure: inserting RAM into the memory slot)

RAM is a primary storage unit responsible for holding data that is being processed by the operating system and other programs. Note that the data is being stored temporarily a(volatile) and will be wiped when power is off. In our build we used a 16GB DDR4 LPX vengeance by corsair.

Its important to know in which slot you insert your memory module. Usually new motherboards come with dual channel slots meaning if you have two memory sticks and you insert them in the two slots that belong to the same memory channel you would be using your memory in single channel (2 8GB sticks in same channel) which is considered a bottleneck for your system performance compared to having the 2 8GB sticks each in a different channel slot for best performance. Usually, some motherboards indicate the memory channels by using different colours for each memory slot to help you.

STEP 8:

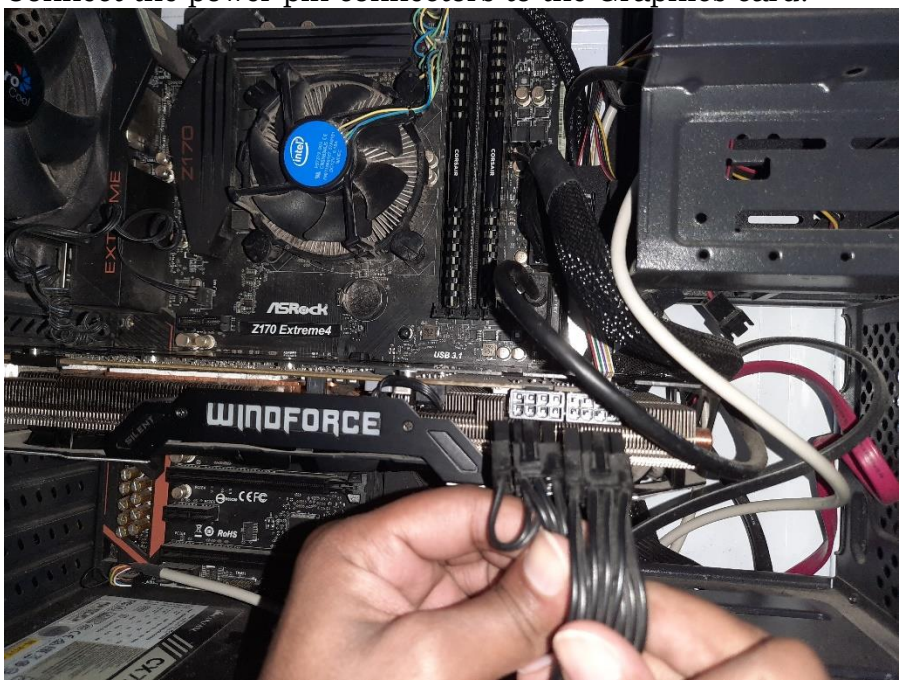
Insert the graphics card into the PCIE slot(ensure you use the highest speed PCIE express lane for best performance).

(Figure: inserting Graphics card)

A graphic processing unit is responsible for rendering frames and displaying them on the monitor.This build is for a gaming pc so we used a GTx980Ti G1 series card from Gigabyte with 6GB GPU memory.

STEP 9:

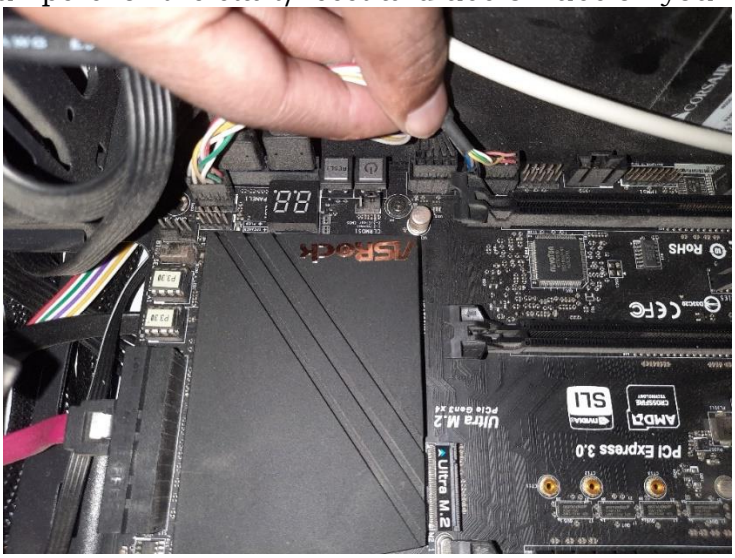
Connect the power pin connectors to the Graphics card.



(Figure: connecting PCI-E connectors)

STEP 10:

Connect the jumpers for the start/reset and usb 3 hubs on your motherboard.



(Figure: connecting front panel connectors)

This step can be tricky. To know the exact positions refer to your motherboard booklet for instructions.

STEP 11:

Close the case and attach the HDMI/ Keyboard/Mouse /Wifi dongles to the back of the case and into the motherboard.

(Figure: Assembled computer with case open)

(Figure: Assembled computer with case closed)

STEP 12:

Conenct the HDMI and other I/O like keyboard, mouse wifi dongles.

Our Input devices for this part are the following:

1. Razer Death adder mouse: A mouse is used as a tool to enhance the interfacing capability of individuals when using a PC. It accepts pointing movements from users and translates them in to a format that the machine can read.

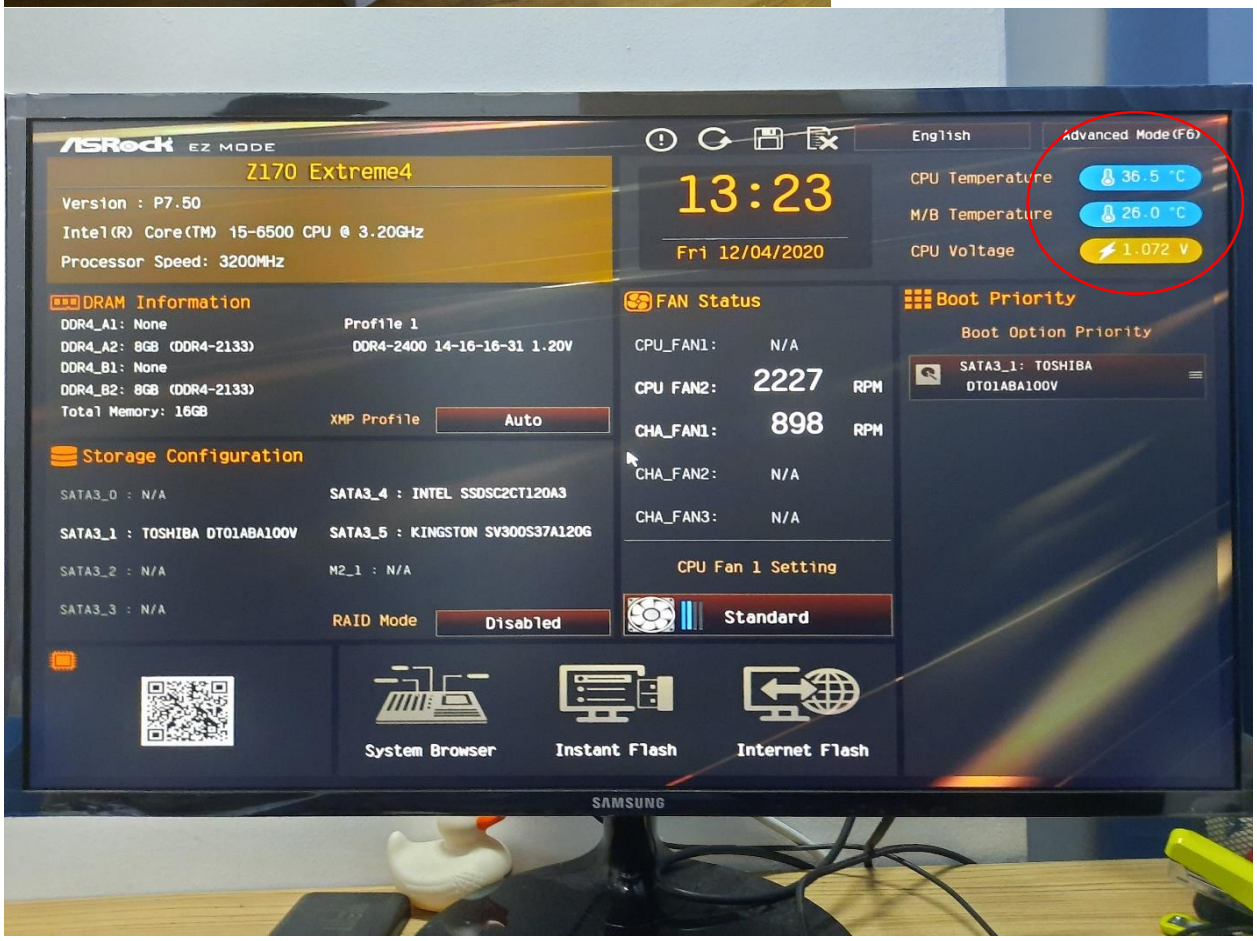
2. Logitech G613 Keyboard: A keyboard is an input generating unit that translate data into a form which the computer can understand and process. Logitech G613 keyboard is the unit we chose; it is considered as a traditional keyboard.

3. TP-Link Wi-Fi Adapter: used to connect wirelessly to the network and have access to the internet.

4. Generic headphones: we used generic inexpensive headphones with a mic.

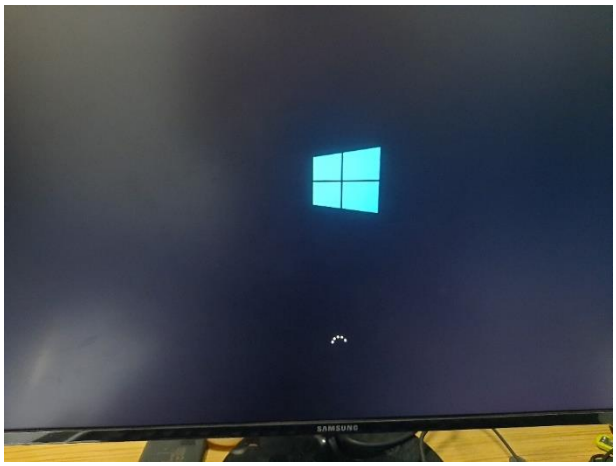
STEP 13:

Connect the monitor to HDMI port and start the pc.then Monitor the temperature to ensure the heatsink is sitting properly and the memory installed matches what the system detects.



STEP 14:

Install your prefered operating system in our case we are installing windows 10 professional 64bt edition.



STEP 15:

Clean up the area and keep the computer in an area with access to air for proper cooling.

Extra tips:

Keep the computer running after it has been installed under high load for sometime, this is to ensure that the system is stable and has no errors or crashes.

Water cooling a system is a great way to reduce thermal output which allows for the processor to function without throttling.But installing a water cooling solution nrequires a great deal of experience.This is because any errors during installation would result in water damage to all your components.This combined with electrical hazard from the electrical components could cause serious injuries.

References:

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