UTM UNIVERSITI TEKNOLOGI MALAYSIA
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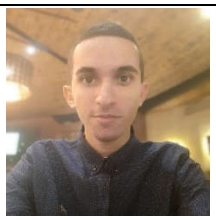
Section : Section 11

Assignment : Step by step PC Assembly

GROUP NAME / NUMBER: Group 3

1		Name: AHMEDALLA HANEA HAMZA HAFEZ HANOURA Matric Number: A19EC4045 Phone Number: +966544984525 E-mail: hhahmedalla@graduate.utm.my
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Tools needed to assemble a PC:

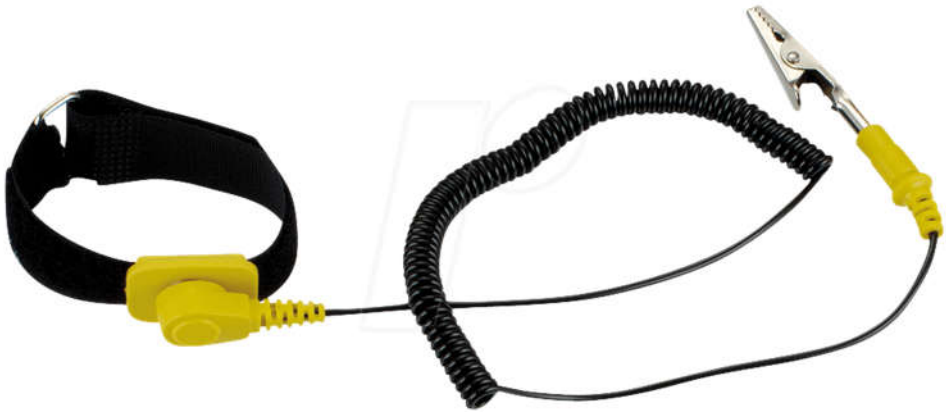
1.0 Screwdrivers Kit

Screwdriver is a tool that used to install and remove screws to assemble all the pieces of the PC together. It is often hand operated tools but recently electric ones are used to save time and effort. screwdrivers are the most important tool in our case because with out it we can't assemble the parts together; it is very important also to ensure that all parts are placed in their places securely.

2.0 Pliers

Pliers are tools that used to hold, bend, and sometimes cut objects, the main function of it, is to hold the small parts of the PC tightly so we can remove or insert cables from or to their known spots without causing damage to cables. Pliers are very important in the PC assembly process to hold the different types of wires securely also some wires need to be twisted using the pliers to minimize the electromagnetic radiation, and inductance of the wire.

3.0 Anti-static Equipment



Anti-static workstation is a tool used to help reduce the electrostatic discharge while installing and merge all the PC components together. It is very important to dissipate any static charge while being grounded so we need to use this equipment by putting the metal alligator clamp on a metal part and the other end part of the strap on your wrest or ankle to ensure that no charge can pass through our body to the PC components, much more, it helps us from getting shocked by the static charge that can be gathered during assembling the PC.

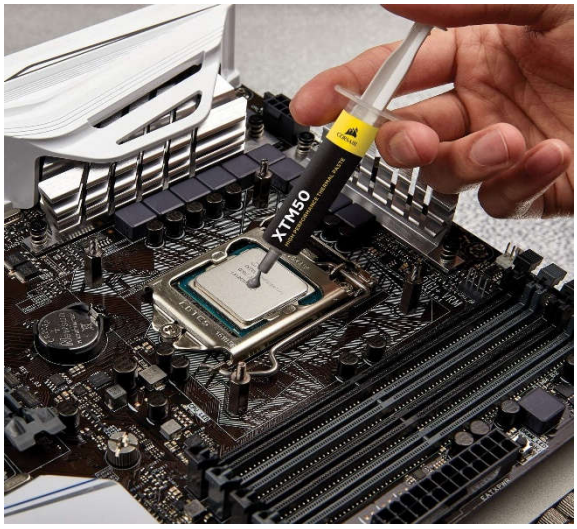
4.0 Twist Ties

Twist ties are used to organize the cables or wires that used in PC assembly process. It is important to use them to keep the PC setup neat and clean, it will help a lot if we need to change any cable because it will keep all the cables clear to see.

5.0 Alcohol Pads

Alcohol Pads are used to clean sensitive PC components such as CPU without causing any harm to it. We can see the importance of these pads in how it can clean without causing damage to components, because it is the only affordable and efficient way to do that.

6.0 Thermal Paste



Thermal paste main function is to keep CPU cool and not to overheat. It is a substance that made by some companies to be applied as cooling solution, thermal paste is very important specially with the new CPU's that costs a huge deal of money because it will help by controlling the processor temperature and that will lead to better performance.

As we can see, we will need these tools for any PC assembly process to ensure that everything is going to work probably well. Briefly, the tools we need is Screwdrivers kit, Pliers, Anti-static equipment, Twist ties, Alcohol pads, and Thermal paste. So, in the next part we will discuss about the layout of the motherboard to give a clear idea for how can we use these tools assembling the PC.

A Sketch of Motherboard Layout:

1.0

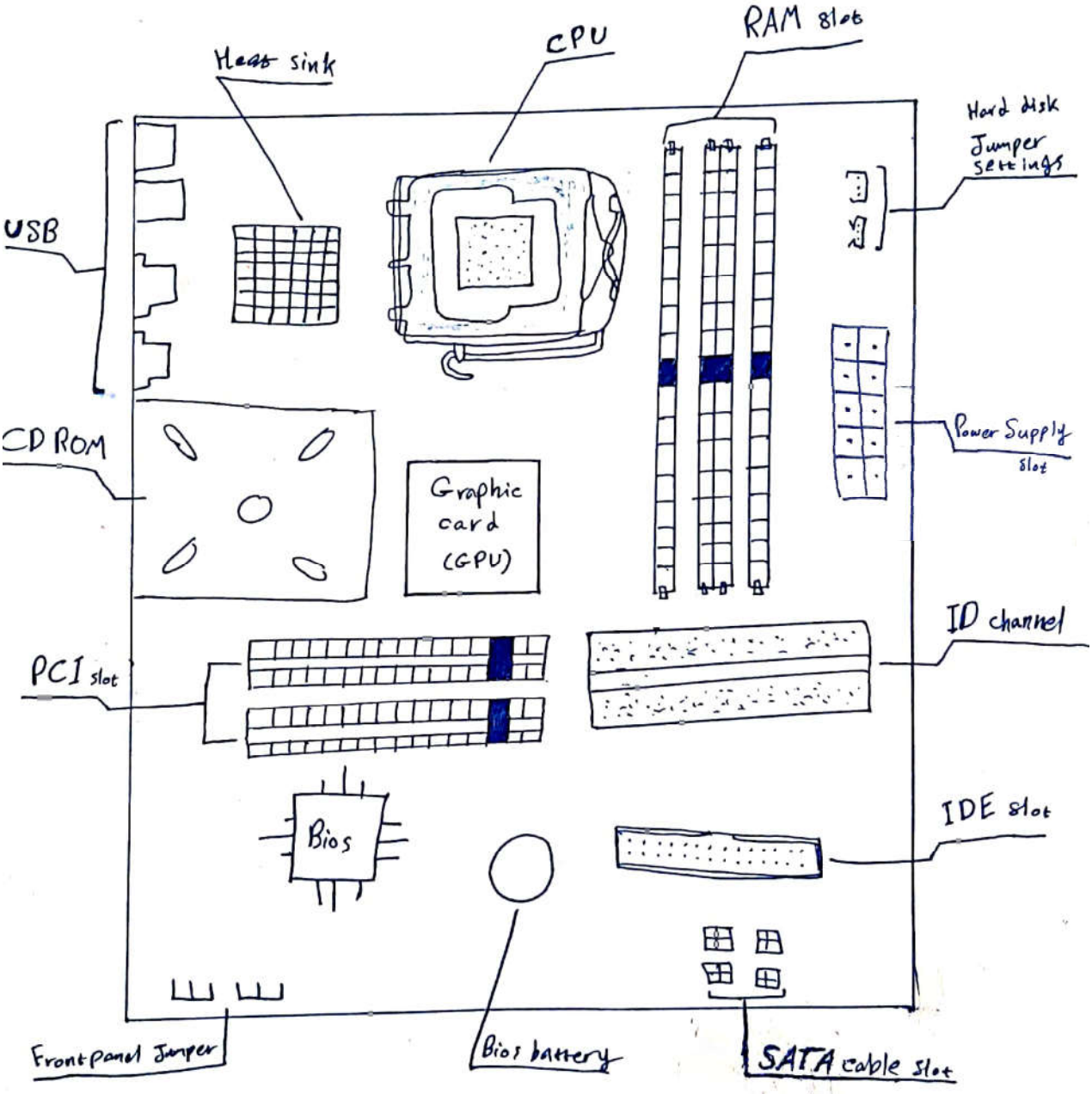


Figure1: Sketch of Motherboard Layout

2.0 Explanation of motherboard components:

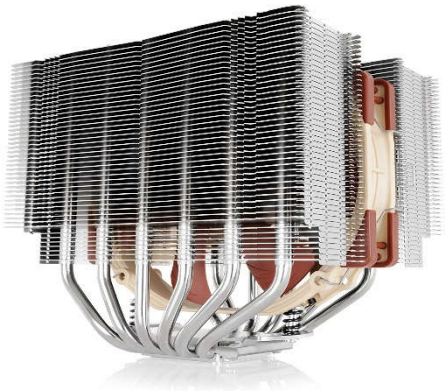
- Graphics Card (GPU)

A Graphics card is a programmable processor specialized for rendering all pictures on the computer's screen. A GPU provides the quickest graphics process and it is the most important component for gamers, engineers, and graphic designers because they need a powerful render ability. One of the newest and most known examples nowadays is NVIDIA GEFORCE RTX 3090 this card is very powerful and can perform any task given to it easily from gaming to rendering high-quality 3D images.

- Processor (CPU)

The CPU is the unit that performs most of the processing on a computer. To manage guidelines and statistics float to and from other parts of the computer, by performing the fundamental arithmetic, logic, controlling, and Input/output (I/O) operations, the principal components of CPU includes Arithmetic Logic Unit (ALU), Control Unit (CU), and Registers/The Memory Unit (MU). Intel 10th gen core i7 is a clear example of processors used in PCs recently due to it is performance and cost.

- Heat sink



The processors we have on our computers and laptops today are powerful and generate a lot of heat as a result, we need a heatsink to prevent overheat of the CPU. It is a device used to remove and extracts the heat from the processor, in other words, it is very important as a cooling solution. A model that we recommend to use is Noctua NH-D9L it is an excellent heat sink that can increase the lifetime of the processor by keeping it cool.

- CD ROM

CD ROM is a type of device that used to share and distribute PC software applications, media, and games. It is a compact disc that can read-only data without the ability to write, it was popular 20 years ago but now it is very rare to use or even to see one. One of the examples that were used back in the days is ASUS CD-S520/A 52Xmax IDE CD-ROM Drive.

- USB Cable

USB stands for "Universal Serial Bus", USB cables are a number of the most widespread cable sorts offered, used largely to attach computers to other devices like printers, mobile phones, data storage devices, and much more. Corsair cables is usually the best to use such as, Corsair Vengeance 2000.

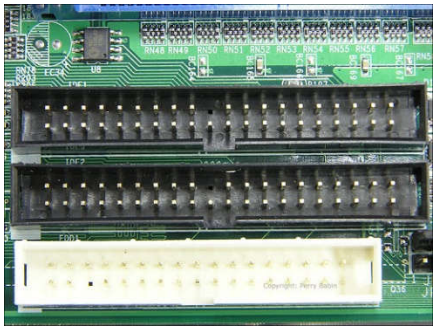
- SATA Cable

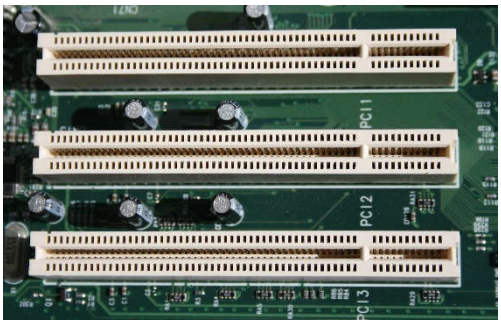
SATA cables stand for “Serial Advanced Technology Attachment” cables, are used to connect devices in computer or PC cable assembly process, mainly used with storage devices to achieve the highest speed possible. A model example is DZTSMART 5 Pack SATA III cables that is very easy to use and very affordable.

- IDE Cable

IDE cable function is to connect a hard drive or optical drive to the motherboard or more than one at the same time. StarTech.com Model IDE66 18" Ultra ATA/66/100/133 80-wire IDE Cable is a very good and fast cable to use on the motherboard because it is compatible with almost all the motherboards nowadays.

- IDE & PCI slots





IDE slots are used to connect hard drives and optical devices to the motherboard, While PCI slot is used to attach and connect devices to the motherboard such as modems, network cards, and sound cards. Usually, both slots are built-in with the motherboard as a port, IDE 40 pin and PCI-E 1.0 are very known as the most used slots.

- Hard disks

is an electromechanical data device that stores and retrieves digital data using a data-storage medium and one or a lot of rigid quickly rotating platters coated with magnetic material. HDDs are a kind of computer memory, retentive keep data even once battery-powered off. As an example, Western Digital 1 TB WD10EZEX is very good that performs very well and at a low cost.

- Power Supply

is a device that provides power to associate electrical load. the first performance of an influence offer is to convert electrical phenomenon from a supply to the right voltage, current, and frequency to power the load. Corsair CV Series CV650 650W 80 is a device that known as the best power supply on the market recently, it is very powerful, easy to use, and can protect the PC from any overload in electrical current.

- RAM

RAM stands for “Random Access Memory”, Random-access memory may be a type of memory device that can browse and altered in any order, usually used to store operating data and code. A random-access device permits data things to browse or written in nearly a similar quantity of time no matter the physical location of information within the memory. Kingston Fury Memory is a great example of efficient RAMs you can choose from 4 GB to 32GB per stick, surely more capacity means a better performance experience.

After sketching a motherboard layout, we now have a clear view of the motherboard and components involved in the PC assembly process. Moving on to the last part of the process which is a step-by-step PC assembly.

Step by Step PC Assembly:

Step1: Being statically safe.

The first thing we're going to do is get ourselves static-safe so we're going to use the anti-static equipment in order to dissipate any static that's built up on our bodies. We just need to put the alligator clamp on a metal part and the other end either on your wrist or as preferred on your ankle this way is great because it will not be on your way while you're trying to build the PC.

Step2: CPU installing.

Moving to installing the CPU we can go ahead and install it, step one is to push down the lever pull it out and then the retention plate should move out of your way then we're going to see this little golden triangle here we're going to line that up with the dot at the corner of the socket on. Putting it in it's really important to apply no force at all you're just kind of dropping it in in exactly the right place, we also recommend to shake it slightly to be placed firmly. Next, we're going to drop the plate down making sure that it stays clear of hitting the screws, and lower the arm pull it out and put it under the retention mechanism.

Step3: Installing the RAM.

We can Install RAM by lining up the memory with the slot, make sure you carefully check the position of the notch so you can see in the image. Then, pull back the tabs remember to do that slowly to not break the slot, push firmly from both sides until you hear a click on each end, and that's all.

Step4: Installing heat sink and thermal paste.

In this step we will plug the heat sink on the CPU to ensure that our processor is cooled probably well, first thing we need to do is to align the heat sink with the screws at the motherboard to secure it in its place but before doing that we should apply thermal paste between the heat sink and CPU and this step is very important because it will help to keep the processor cooled without the need to clean the heat sink every week.

Step5: Installing Hard drive and cables.

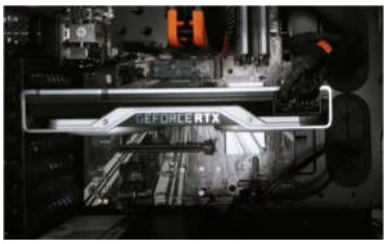
Actually, Hard drives are the easiest part to install nowadays all we need to do is to slide the hard drive in its place in the case then we can use the SATA cable or other cable that can work with the HDD and plug one end into the HDD and the other to the motherboard. When it comes to cables, we need to plug all the dedicated cables in the case with its slot at the motherboard.

Step6: Power Supply installation.

To install the power supply, we can keep it outside the case or keep it inside the case if there is a space available. We will use the screws that usually came in the same box of it to secure it inside the case as we recommend, lastly, we need to connect it by AC adapter to the motherboard.

Step7: Installing Graphics card (GPU).

Installing GPU recently, is better to be the last component to install in the PC assembly process. GPU installation is plugged to motherboard by PCI cables from the card to the slot in motherboard easily as a tip we need to make sure that all pins is straight and not bended before installing it. We also need to apply an even pressure while placing GPU in its place securely and firmly, in the other hand we need to line up the I/O while installing the card I the case.



Last Step(step8): Closing the case and connecting the PC with gadgets needed.

Lastly, after a long journey of assembling the PC, we now reached the best moment for anyone who is putting the last touches to construct the fully working system. We need to ensure that the motherboard and all components included in it fitted in the case correctly, after that we will put the front panel back in its place and make sure that all cables in the case are connected and working with the motherboard. Moving on after closing the case we will connect the PC with the screen using HDMI cable and connect the mouse and keyboard using USB ports to control the device. Now we can click the power button and be proud that we assembled a fully working PC.

In conclusion, we want to say that assembling a PC is not hard but you need to be focused all the time keeping in your mind that some components are sensitive and we need to be careful from all the screws especially small ones, and the most important thing is to follow safety guidelines while constructing the system.

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