SCHOOL OF COMPUTING
Faculty of Engineering

Semester I 2020/2021

Subject : Technology and Information Systems (SECP1513)
Section : 01
Assignment : Step by step PC Assembly

GROUP NAME / NUMBER : 09

1.		Name : Heong Yi Qing Matric Number : A20EC0043 Phone Number : 016-4161666 Email : heong@graduate.utm.my
2.		Name : Roshini A/P Thavan Nair Matric Number : A20EC0139 Phone Number : 0124754974 Email : roshini01@graduate.utm.my
3.		Name : Sayang Elyiana Amiera binti Helmey Matric Number : A20EC0143 Phone Number : 01140497562 Email : sayangelyianaamiera@graduate.utm.my

PART A – TOOLS

1.0 Screwdrivers

Function : Used for screwing and unscrewing screws

Importance : to screw the motherboard standoffs into the case

2.0 Thermal paste

Function : Eliminate air gaps or spaces from the interface area in order to maximize heat transfer and dissipation.

Importance : helps CPU cooler do its job

3.0 Wire cutters and strippers

Function : used to strip the electrical insulation from electric wires

Importance : snip the excess off of cable ties

4.0 Needle-nosed pliers

Function : used to squeeze in tight spaces and move or bend wires.

Importance : remove and insert jumpers on motherboards and hard drives

5.0 Anti-static wrist strap

Function : used to safely ground a person working on very sensitive electronic equipment

Importance : prevent building up of static electricity on body during pc assembly

PART B

1.0 SKETCH OF MOTHER BOARD LAYOUT

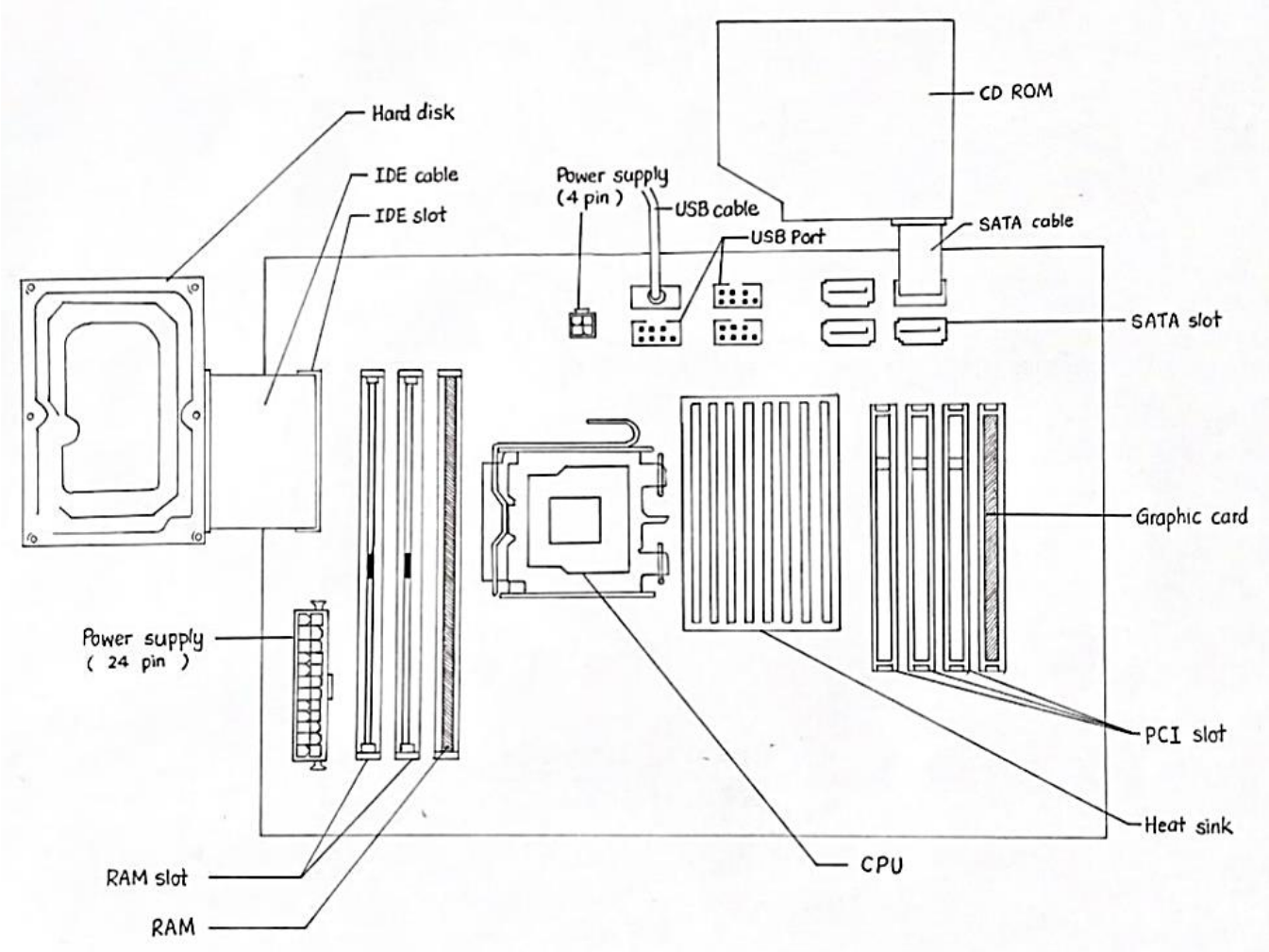


Figure 1 : simple diagram of a motherboard layout

2.0 FUNCTIONS AND MODELS OF COMPONENTS IN MOTHERBOARD

2.1 Graphic card

Function:

- Graphic card enables a computer to produce the image we see on a monitor.
- Graphic card helps to produce an image with faster motion and better details[i].
- It is responsible for rendering an image on our monitor.
- It is necessary for some computer games and video software.

Example of models:

- Nvidia GeForce RTX 2080 Ti
  (Boost Clock: 1635MHz | Memory: 11GB GDDR6 | CUDA Cores: 4352 | Memory Bandwidth: 616GB/s)
- Nvidia GeForce RTX 2080 Super
  (Boost Clock: 1815MHz | Memory: 8GB GDDR6 | CUDA Cores: 3072 | Memory Bandwidth: 496GB/s)
- AMD Radeon VII
  (Boost Clock: 1750MHz | Memory: 16GB HMB2 | Stream Processors: 3840 | Memory Bandwidth: 1000GB/s)

2.2 CPU

Function[ii]:

- CPU is called as the ‘brain’ of a computer
- CPU is the center processer, it performs all type of data processing operations
- It is an electronic circuitry within a computer that executes instructions that make up a computer program

Example of models:

- Intel® Core™ i5-10500T Processor
  (12 MB Cache, 6 Cores, 12 Threads, 3.80 GHz Max Turbo Frequency)
- Intel® Core™ i7-10510U Processor
  (8M Cache, 4 Cores, 8 Threads, 4.90 GHz Max Turbo Frequency)
- Legacy Intel® Core™ Processors
  (6 MB L2 Cache, 2 Cores, 2 Threads, 3.00 GHz Max Turbo Frequency)

2.3 Heat sink

Function:

- It increases the heat flow away from a hot device
- Heat sink also help to increase the device's working surface area and the amount of low-temperature fluid that moves across its enlarged surface area

Example of models[iii]:

Heat Sinks Categorized by Material

- Aluminium Heat Sink
- Copper Heat Sink

Heat Sinks Categorized by Airflow

- Passive Heat Sink
- Active Heat Sink

2.4 CD ROM

Function:

- The full name of CD ROM is Compact Disc Read Only Memory
- It is a compact disc that stores computer data of graphics, text, and audio.
- CD ROM can store up to 700MB of data

Example of models:

- HP Laptop DVD ROM
- Standard 5.25 ODD optical DVD CD drive SFF-8551
- PC CD-ROM Drive

2.5 USB Cable

Function:

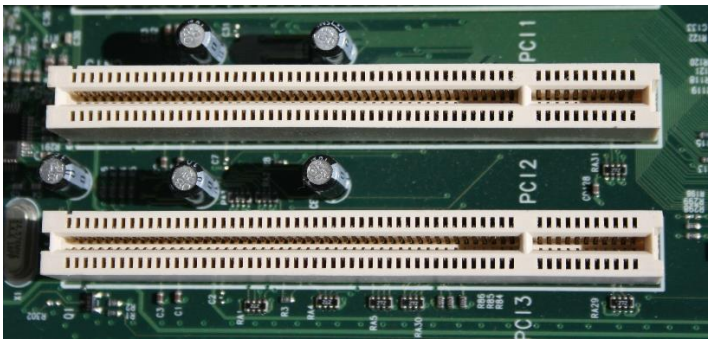
- USB cables gather and transfer data from one device to another effectively
- USB cables are connected to computer units directly to peripheral devices

Example of models:

- USB A-Type.
- USB B-Type.
- USB C-Type.
- Micro-USB A.
- Micro-USB B.
- USB Mini-b (5-pin)
- USB Mini-b (4-pin)
- USB 3.0 A-Type.

2.6 Slots

IDE slots



PCI slots

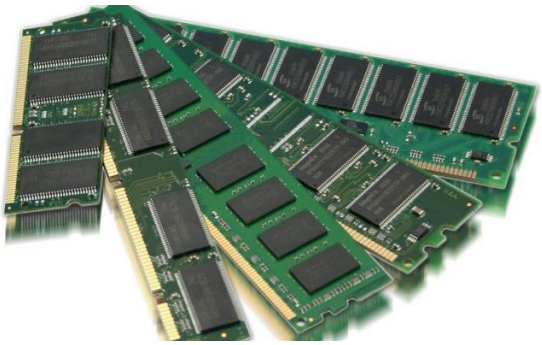
Function:

- A place for adding capability to a computer in the form of connection pinholes
- It is a standard interface for connecting a motherboard to storage devices such as hard drives and CD-ROM or DVD drives.

Example of models:

- PCI slot → for Network card, SCSI, Sound card, Video card.
- PCI Express → for Video card.
- AGP slot → for Video card.
- ISA slot → for Network card, Sound card, Video card.
- AMR slot → for Modem, Sound card.
- CNR slot → for Modem, Network card, Sound card.

2.7 RAM



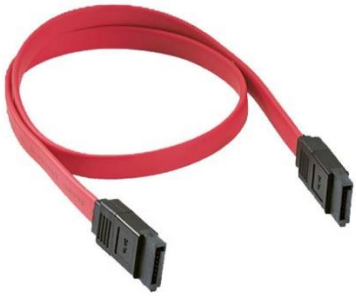
Function:

- RAM provides short term storage space for data and program code that a computer processor is in the act of using, or which it expects to use imminently.

Example of models:

- DDR4 (RDIMM ECC)
- DDR4 (UDIMM ECC)
- DDR4 Mini-DIMM (Unbuffered ECC)
- SDRAM

2.8 SATA Cable



Function:

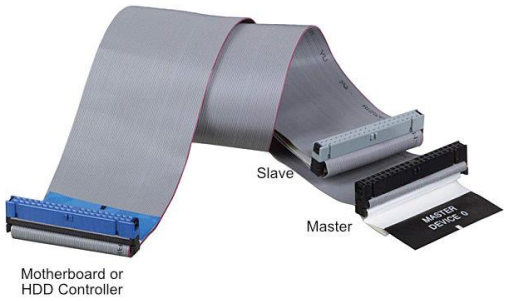
- Serial Advanced Technology Attachment (SATA)

-are used to connect devices in computer cable assemblies, such as storage devices

Example of models[iv]:

- e-SATA → Cable available in lengths ranging from 0.5-2m
- Low Profile SATA → Ultra-thin SATA cables with low profile connectors
- SATA Power → SATA interface power cable
- Micro SATA → SATA data cable

2.9 IDE Cable



Function:

- IDE cable is a standard type of connection for storage devices in a computer
- It is used to connect some hard drives and optical drives to each other and to the motherboard.

Example of models:

- 34-pin cable (for floppy drives)
- 40-pin cable (for hard drives and optical drives)

2.10 Power supply

Function:

- It convert electric current from a source to the correct voltage, current, and frequency to power the load.

Example of models:

- Seasonic 300W PC Power Supply
- Kingses 500W PC Power Supply

2.11 Hard disk (jumper settings either master / slave)

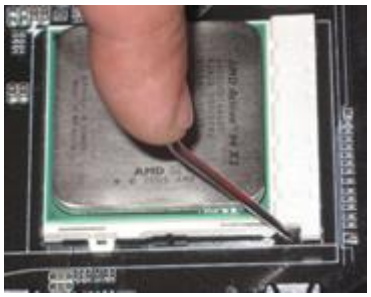
Function:

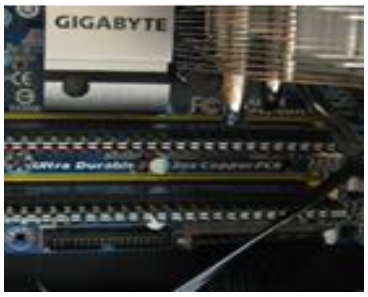
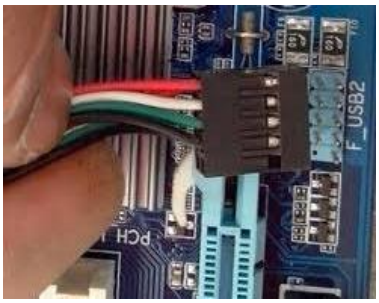
- Hard disk is an electro-mechanical data storage device
- It stores and retrieves digital data using magnetic storage and one or more rigid rapidly rotating platters coated with magnetic material.

Example of models:

- Western Digital 1 TB Internal Hard Drive (WD10EZEX)
- Seagate 1TB Internal Hard Drive (ST1000DM010)

PART C - "Step by Step PC Assembly"[vvi]

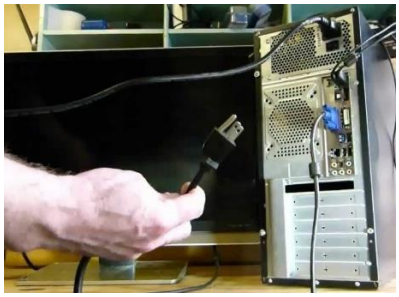
1.		**Mount CPU / processor** • locate CPU holder on motherboard • lift up the lever • line up with the alignment • place the CPU
2.		**Install heat sink** • apply some thermal paste on CPU • seat the heat sink in position • plug the power cable attached to the heat sink into the motherboard connector
3.		**Mount motherboard** • screw the motherboard standoffs into the case • fasten the motherboard in place on top of the mounting standoffs
4.		**Install power supply** • mount power supply and fasten with the screws • plug the largest cabling connector from power supply cabling into motherboard power connector • plug the 8-pin cabling connector from the power supply cabling into the CPU power connector
5.		**Install graphic cards** • remove expansion slots cover form rear of the case • slot the graphic card into PCI expansion slot • screw it in place

6.		**Mount memory (RAM)** • press to open the clips at both ends of the RAM mounting slots • line up the notch on the RAM stick with mounting slot • seat the Ram ad press it firmly down into the slot
7.		**Mount CD ROM** • remove any front panels from the computer case where the optical drive will sit • mount optical drive in the case by fixing with screws through the case frame into the case mounting holes located on the CD ROM
8.		**Install hard drive** • mount hard drive in the case bays • fix with screws through the frame into the case mounting holes located in the storage drive
9.		**Connect SATA cable** • connect SATA cable from CD ROM to the motherboard • connect SATA power connector from PSU to drive • connect the drive to the motherboard using SATA cable
10.		**Connect USB cable** • connect case's front panel USB 3 wire from case to a USB 3 header on motherboard • align the notch on the connector with the notch on the header and insert connector • if the case has only a front panel USB 2 cable, connect it to a USB 2 header on the motherboard

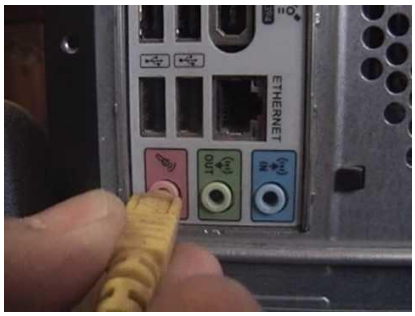
11.

Closing the case and connecting the peripherals

Place the side cover back on and secure the side panels with case screws.



Connect peripheral devices which include keyboard, mouse, wireless network dongle, printer and webcams with your CPU by plugging into USB port.



Then, connect speakers and microphone into 2.5 mm sockets.

Finally connect the CPU with monitor by plugging into VGA cable ports.

References

[i] Eri Luxton (2020). *What is the function of the graphic card.* Retrieved from Techwalla: https://www.techwalla.com/articles/what-is-the-function-of-a-graphics-card

[ii] *The function of CPU.* Retrieved from tutorialspoint, simply easy learning: https://www.tutorialspoint.com/computer_fundamentals/computer_cpu.htm#:~:text=CPU%20performs%20all%20types%20of,all%20parts%20of%20the%20computer.

[iii] *Heat Sink Type.* Retrieved from Celsia: https://celsiainc.com/technology/heat-sink/

[iv] RS Components Ltd. *Types of SATA Cable* Retrieved from RS-Online: https://uk.rs-online.com/web/generalDisplay.html?id=ideas-and-advice/sata-cables-guide

[v] Freedman, A. E. (2020, August 26). How to Build a PC. Retrieved from tom's Hardware: https://www.tomshardware.com/reviews/how-to-build-a-pc,5867.html

[vi] jimirayblues. (2017). How to Assemble a Basic Desktop PC. Retrieved from instructables circuit: https://www.instructables.com/How-To-Assemble-A-Basic-Desktop-PC/