UTM UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
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Subject : Technology and Information Systems (SECP1513)

Section : 01

Assignment : Step by step PC Assembly

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PART A - List at least FOUR tools needed to assemble a PC. For each tool, Provide picture(s), explanations of its functions and its importance.

1.0 Screwdriver

Figure 1: Phillips head screwdriver

In the process of assembling a PC, a screwdriver is the most basic needed tool. The screwdriver is use to tighten the screws on the components in order to build up the PC. In this case, a Phillips head screwdriver as shown in Figure 1 is most recommended to use because almost all the screws in a PC are cross-headed. Screwdriver is very important because without it, we are not able to assemble all the components. Besides, a magnetic screwdriver is the icing on the cake! This is because, the screws are all small in size and if it fell into the small, dark or hard to reach places, it will become a trouble.

2.0 Light Source

Figure 2: A desk lamp

Figure 3: A headlight

A light source is very important in the process of assembling a PC. This is because the PC cases are full of shadows, and most of the components needed are black in color. So, we need a light source to provide us a clear vision. In this case, a headlight or a desk lamp is chosen as our tool to make sure we have a clear and bright sight. By looking clearly, we can avoid ourselves from making mistakes. These two types of light have a similarity which is they are both hands-free. A hands-free light source can make our progress more convenient and consume less time.

3.0 Cable Ties

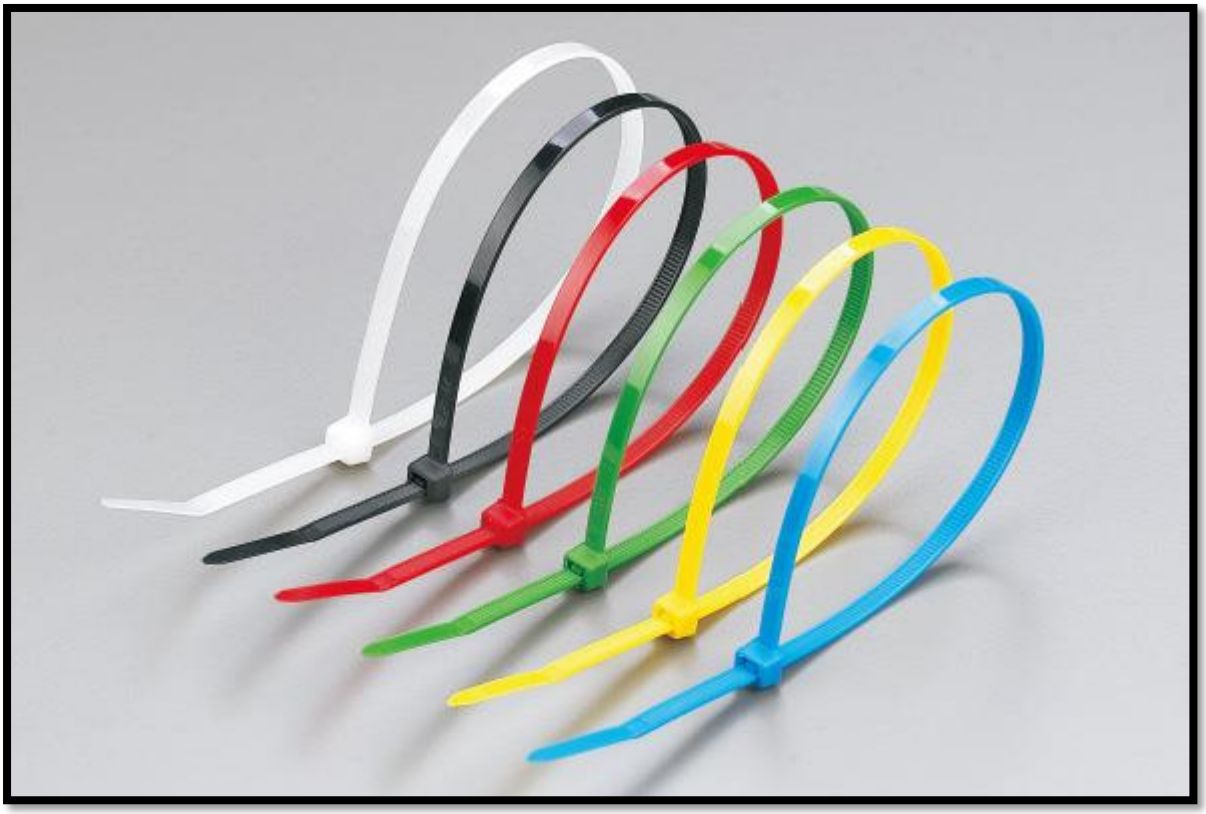


Figure 4: Cable ties

When assembling a PC, there will be a lot of cables such as HDMI cable, VGA cable, DVI cable, Ethernet cable and many more. When we connect all these cables, we can use the cable ties as shown in Figure 4 to manage the cables by bundling up the cables. This tool is important to make sure the cables are arranging neatly as well as avoid them from fans and other components inside the computer. Other than that, this action is also essential to avoid dust accumulation and ensure the airflow is always high. Moreover, we can also use different color of cable ties to differentiate the cables.

4.0 Anti-static Equipment

4.1 Anti-static Gloves

Figure 5: Anti-static gloves

When we assemble the PC, we are mostly using our hands and there are many electronic components to be installed. To avoid the risks of getting electric shock, we can use a pair of anti-static gloves as shown in Figure 5. The anti-static gloves are made of polyester material and designed for electronic assembly where bare hands are not desired. In this case, gloves in white are recommended because most of the cables are black in color. So, a pair of white gloves can also help us to look more clearly.

4.2 Anti-static Mat

Figure 6: Anti-static Mat

As we mentioned above, there are many electric components and metal objects when assembling a PC. In order to minimize the risk of electrostatic discharge, we can place an anti-static map on the floor of the workplace as shown in Figure 6. An anti-static map has a low electrical resistance of between 0.1 and 1000 Mega Ohm. It can be used to prevent the electrostatic charge in our body building up by dissipating this charge. This is important to protect our safety and also make sure the components did not damage by electric shock.

PART B - Sketch of a mother board layout

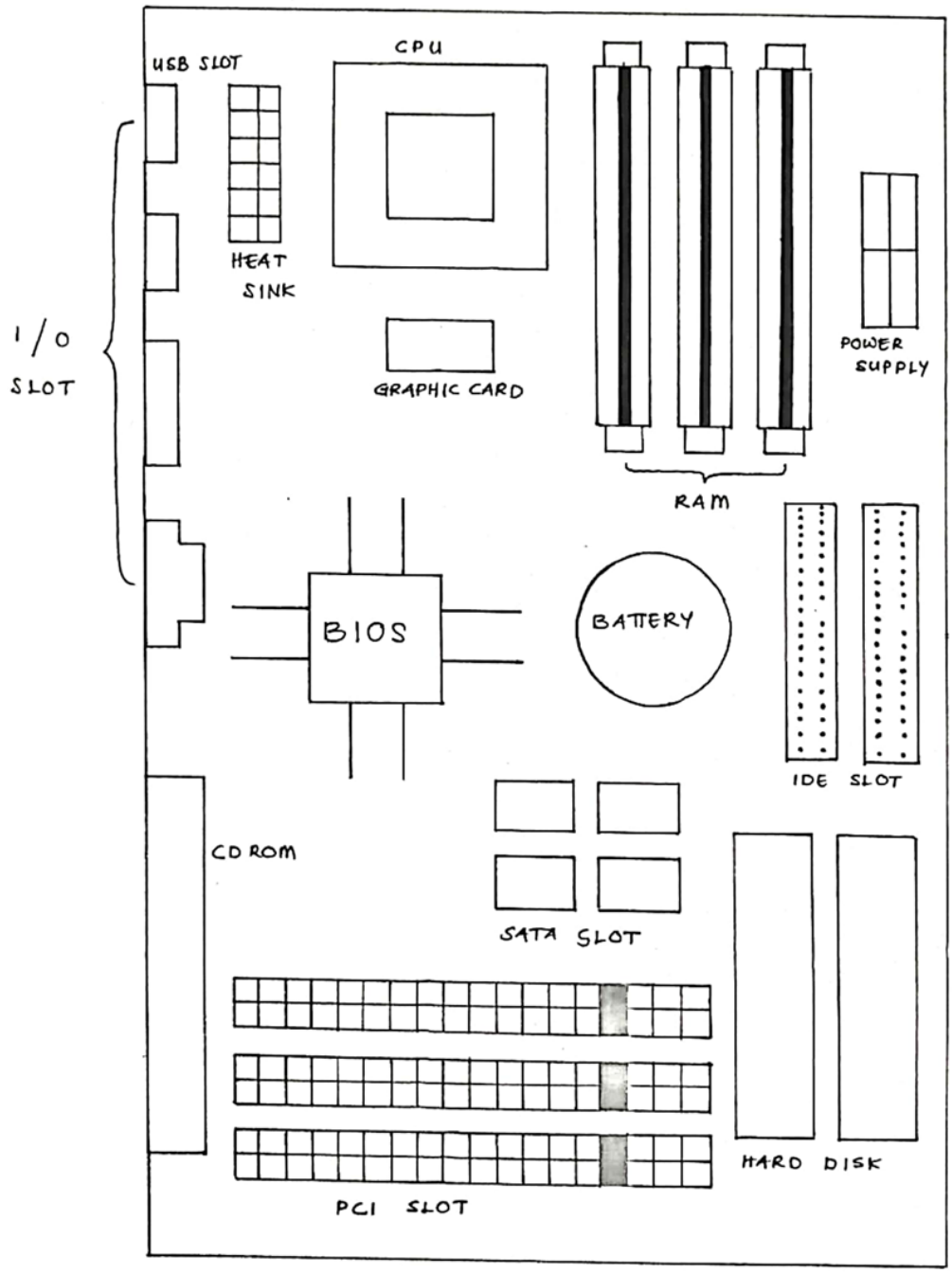


Figure 7: Sketch of motherboard layout

PART B - Provide picture(s), explanations of its functions and example of models.

Graphics Card

A graphics card, also called a video card is a circuit board in a computer with specialized hardware optimized for displaying high-quality graphics at a high rate of speed. A graphics card can be integrated within the motherboard or be added on as an extension card. Graphics cards function to produce graphics and images more quickly. A graphics card has its own processor, a GPU or graphical processing unit. The video card connects to the motherboard and the monitor to accept information from the CPU (central processing unit) and send output to the monitor.

Model: Nvidia GeForce GTX 3080 Graphic Card

USB Cable

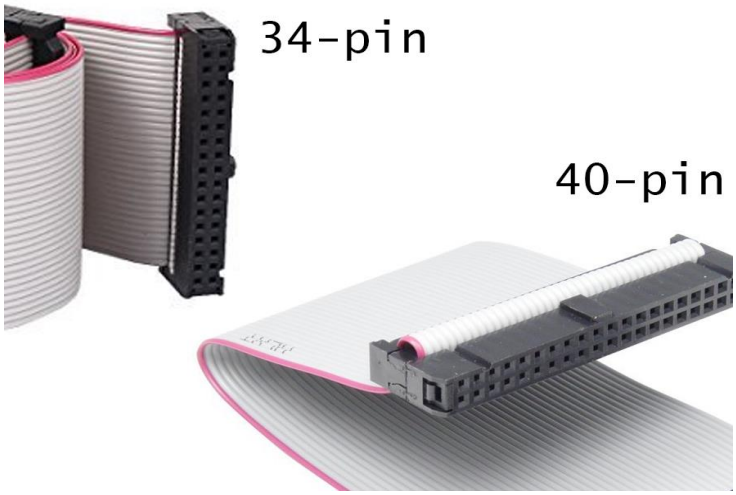
A USB cable is a standard cable connection interface for personal computers and consumer electronics devices. USB cable allow USB devices to be connected and transfer digital data with each other. It also carries electric power across it to devices that need it.

Type: Micro USB cable

Model: Anker PowerLine Micro USB Cable

IDE Cable

IDE also known as *Integrated Drive Electronics* is a standard interface that connects the computer motherboard to a storage device. IDE cable is used to connect from the motherboard of a computer to the hard drive, CD drive and floppy drive. The most common of these types of cables are the 34-pin floppy drive cable that connects from the motherboard to the floppy drive and the 40-pin ribbon cable that connects from the motherboard to the hard drive and the CD drive.



Type: 34-pin and 40-pin IDE cable

Model: Asus ATA 33/100/133 40-Pin 80-Wire Dual IDE Cable

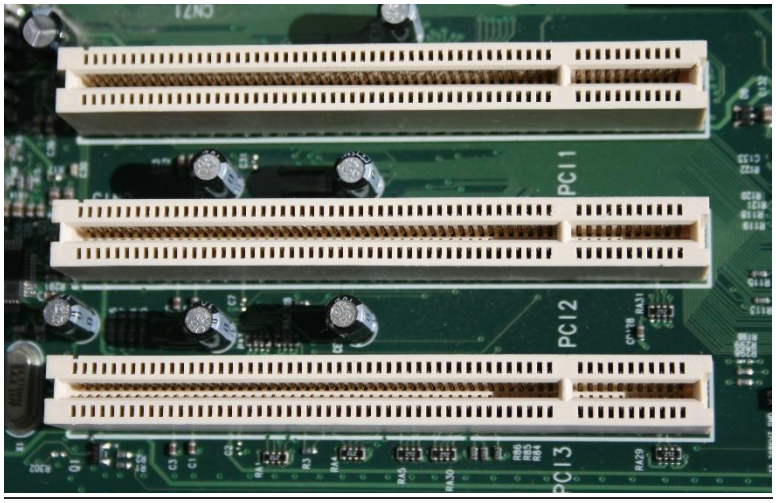
CPU/Processor

A central processing unit (CPU), also called as processor is the electronic circuitry within a computer that executes instructions that make up a computer program. It is considered as the brain of the computer. The CPU performs all type of data processing operations such as basic arithmetic, logic, controlling, and input/output (I/O) operations specified by the instructions in the program.

Model: Intel Core i9-9990K Processor

Slot (IDE, PCI)

PCI also known as "Peripheral Component Interconnect" is a hardware bus used for adding internal components to a desktop computer. IDE also known as *Integrated Drive Electronics* is a standard interface that connects the computer motherboard to a storage device. The function of a PCI and IDE slot is to provide a common interface that can be adapted for virtually any use. It allows user to insert the cable connecting the hardware and have it work with a computer.



Type: PCI slots

Type: IDE slots

Power Supply

A power supply is a hardware component that supplies electric power to an electrical device. The primary function of a power supply is to convert AC from an electrical outlet to DC. The DC voltage will be used to power the motherboard and other internal component of a computer. It also provides cooling and facilitate air flow through the case.

Model: Armaggeddon Voltron Bronze 235FX Power Supply

Heat sink

A heat sink is a component that makes the heat dissipates away from a hot device. The heat sink has a thermal conductor that carries heat away from the CPU into fins that provide a large

surface area for the heat to dissipate throughout the rest of the computer, thus cooling both the heat sink and processor. It also allows the device's temperature to be regulate.

Model: Cooler Master Hyper 212 EVO Heatsink

RAM

RAM or known as "random access memory" is a hardware component which function by providing temporary storage space to store computer programs and results quick access to files that the computer is actively reading or writing. RAM data is temporary and will be erased when the computer is switched off or when another program needs the space for its own use.

Model: Hynix DDR3 2 GB Dual Channel PC RAM

Hard Disk

A computer hard disk drive (HDD) is a non-volatile memory hardware device that controls the positioning, reading and writing of the hard disk. Hard disk drives are commonly used as the main storage device in a computer. Hard disk function to store operating system, software programs and other files. It also can be found in desktop computers and other mobile devices.

Model: Western Digital 1TB SATA HDD

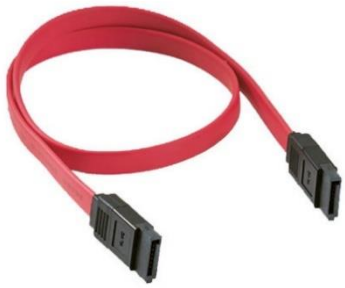
CD ROM

CD-ROM also known as “Compact Disc Read Only Memory”. It functions as a compact disc that stores computer data of graphics, text, and audio. CDs can be created in two forms, an audio CD and a data CD. CDs are also widely used as installation discs. Many software that bought from the store is stored on a CD and needs to be installed by inserting CD to the CD drivers.

Model: LG 24X Super Multi Internal DVD Writer

SATA Cable

SATA also known as "*Serial Advanced Technology Attachment*" is an IDE standard for connecting devices like optical drives and hard drives to the motherboard. The SATA cables are used to connect a mass storage device such as hard disk drives, optical drives and solid-state memory drives to the motherboard. A SATA cable is composed of two plugs. The small one is used for transmitting data, and would be the plug that leads to your motherboard or storage controller. The large plug on the right supplies power, on a desktop computer this would be a direct lead from the Power Supply Unit (PSU).



Model: BENFEI SATA Cable III

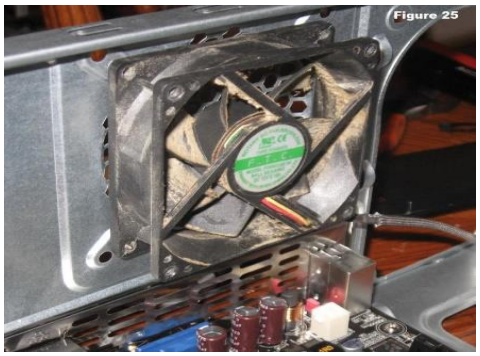
PART C- “Step by Step PC Assembly”

“Step by Step PC Assembly”

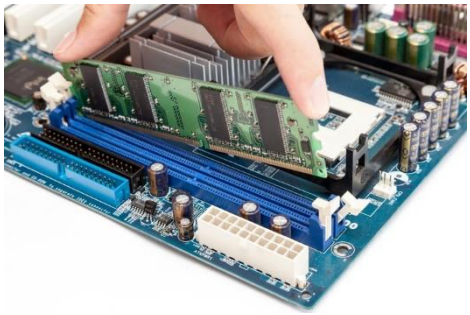
1. Firstly, check all the components and the tools whether they are in good condition. The components needed for this project are hard disk, memory (RAM), power supply, heat sink, processor (CPU), motherboard, graphic card, CD ROM, slots IDE, case fan, SATA cables, IDE cables, USB cables and I/O plate. Whereas the tools needed are computer case, toolkit, light source, cable ties, thermal paste, anti-static gloves and anti-electrostatic mat. The first step is to set up your working place. Make sure to wear anti- electrostatic gloves, use anti-electrostatic mat to minimize the risk of electrostatic discharge and have a good light source.

2. Next, install the CPU and RAM onto the motherboard before placing the motherboard into the computer case, for easier installation. Before permanently installing the CPU, place it to see how it lines up to the socket. You can also refer to the small arrow in the corner of the CPU. When you are sure about the CPU placing into its socket, gently slip it in and press the lever down beneath the safety tab

3. Third, mount the heat sink. Before inserting the heat sink, apply the thermal paste, about pea-sized drop in the middle, on the top of CPU. After that, position the heat sink over the mounting holes while pulling the locking rod down on the fan assembly to lock the heat sink into place. Connect the fan assembly's power connector to the motherboard. Make sure it is tighten down securely using screws. Next, install the case fan on the back panel of the case. Insert the screws from the outside of the case using screwdrivers and tighten it.



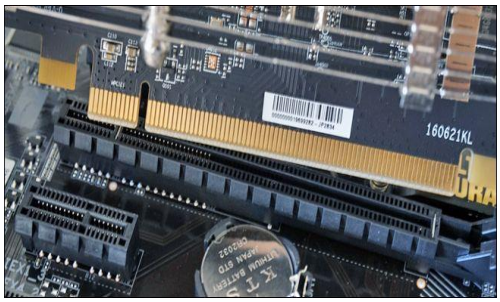
4. After that, install the RAM. Line up the notch in the RAM with the slots and press firmly until it snaps into place. Press down on the RAM at the top and bottom to be sure.



5. Next, install the power supply. Line up the power supply's holes with the mounting space in the case. The part that accepts the power cable (the one that plugs into the wall) should be flush with the back of the computer case, and accessible from the outside. You need to screw the supply in place via the holes on the outside of the case to make it secure.

6. Before you place the motherboard itself in the case, install the I/O plate. This is a little piece of aluminium that fits in the back of the case, with cut-outs for all of the ports on the back of the motherboard. Then, install the motherboard. Screw the spacer into the case and then screw the motherboard onto the spacer at every corner of it.

7. Install the graphics card by pushing it firmly down for it to sit in the large PCIe slot that is closest to the CPU. Then, tighten the screws, securing the card in place.

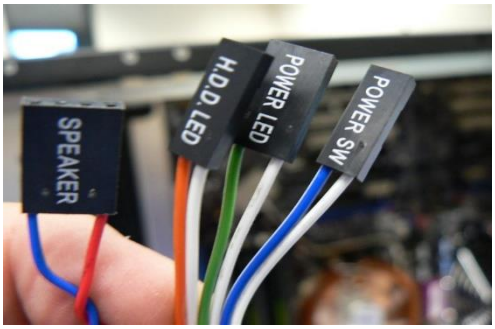


8. After that, slide the CD ROM into the computer case and screw it into position. Attach the SATA power cable from the power supply to CD ROM and the SATA data cable from CD ROM to the motherboard.

9. Installing hard drive. Screw the hard drive into the mounting brackets and attach the SATA data cable from power supply to the motherboard and to hard drive. Connect IDE cable from hard disk to the IDE slot on motherboard.

10. Make sure that all the cables are connected and organize the cables using the cable ties so it will save spaces and lower the temperature inside your computer case.

11. Then, plug the switch wires and USB cables to the motherboard. Refer to the motherboard manual to make sure the placement of connectors are accurate.


SPEAKER
H.D.D LED
POWER LED
POWER SW


USB

12. 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 display ports