UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
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SECP1513
Section-05

Technology & Information System
Step by Step Basic PC Assembly

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Subject : Technology and Information Systems (SECP1513)
Section : 05
Assignment: Step by step PC Assembly

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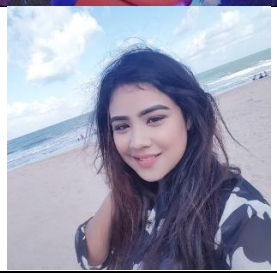
4		Name: Fariha Tabassum Matric No: A20EC4017 Phone No: +8801797685450 E-mail: farihatabassumprovati@gmail.com E-portfolio: https://eportfolio.utm.my/user/fariha-tabassum

Part A: Tools Needed to Assemble a PC

1. SCREWDRIVER:

PC components are fixed in place with screws. Fortunately, the most commonly used screw type in PCs is Phillips-head. Therefore, the main tool used for PC assembly is a Phillips screwdriver, which is used to tighten and loosen PC components. The long shaft also helps to keep the handle at a long distance when operating in a limited space. For the same reason, it is also wise to place a short screwdriver around.

Generally, flat-head screwdrivers are not commonly used when unscrewing a PC, because most of the work is done by a Philips-head screwdriver. However, they may be used to pry up and separate them. When disassembling the PC, it is usually necessary to use a slender "ice axe" flat screwdriver to isolate the plastic case. Hexagonal screwdrivers may be equally useful for deadlock screws on hexagonal board motherboards or some CPU heat sink screws, but should be removed immediately or introduced for stability. Most game-level cases are familiar with stagnation. When various screws are embedded, it is also fixed.

In addition, since most screws are small, magnetic screwdrivers are more preferred in PC assembly. If there is no magnetic function, the screw may be difficult to locate and fix on the screw hole, and it is easy to fall off and fall somewhere during the tightening process.

2. PLIERS:

Unfortunately, sometimes the head of the screw may wear out and be snatched away. When this happens, the main tool is to use several pairs of pliers. Needle nose pliers are versatile. They usually contain wire shapers, which can be used to cut wire insulation and cable ties Pliers are hand tools used to fix and grasp small objects and bend and cut wires.

3. Zip or Cable ties:

It is important to manage the wires to make the internal space of the PC spacious to reduce the chance of dust accumulation and allow a lot of air to circulate. More importantly, it will make the inside of the PC line up neatly and look good. Cable ties are the best way to fix cables in one place. Cables removed in the future can be cleaned with almost invisible black belts, which are almost safe and easy to remove. This allows cables and conductors to be connected during and after cable install.

4. Anti-static equipment (Wristband):

Severe PC assembly should use anti-static wrist strap and other anti-static equipment. Touching a grounded enclosure or other grounded metal objects is sufficient to eliminate the risk of electrostatic discharge and damage to PC components. However, it is best to wear anti-static equipment to be cautious. The main purpose of these tools is to prevent workers from discharging static electricity and prevent damage to PC components.

5. Source of Lighting:

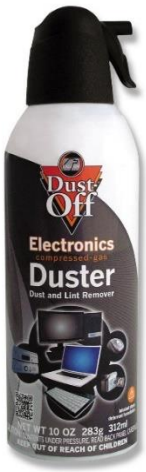
The PC case is full of blind spots. Tiny screws may enter one of the dark corners. A bright desk lamp with a long neck can effectively illuminate, but a headlight is the best tool for

direct lighting. The headlight is always pointed in front of us and we don't need our hands to hold it. The flashlight can complete the task, but because the flashlight must be held by hand, multitasking becomes more difficult. Therefore, in terms of light source, headlights may be the best choice.

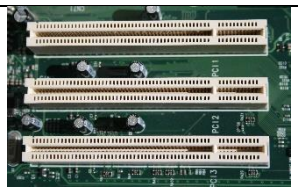
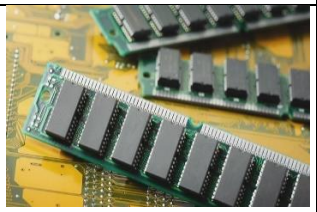
6. Thermal Paste:

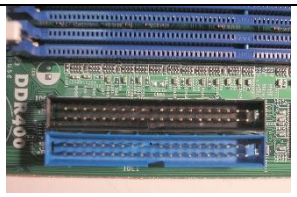
Before installing the cooling solution, thermal paste is usually applied to the processor. If there is no thermal paste, there is still a lot of space between the heat sink and the CPU itself at the micro level. The main function of thermal paste is to fill the air holes or gaps between the CPU and the heat sink, so that they are in full contact, and can easily transfer heat. Thermal paste is essential because it can fill in tiny defects, which in any case will trap air particles between the CP. It is also known as Thermal Grease.

7. A can of compressed air:



A can of compressed air works by forcing air into the container. The air is then forced through an opening in the tank, creating pressure there. Generally, this compressed air is used to clean PC dust that people cannot reach.

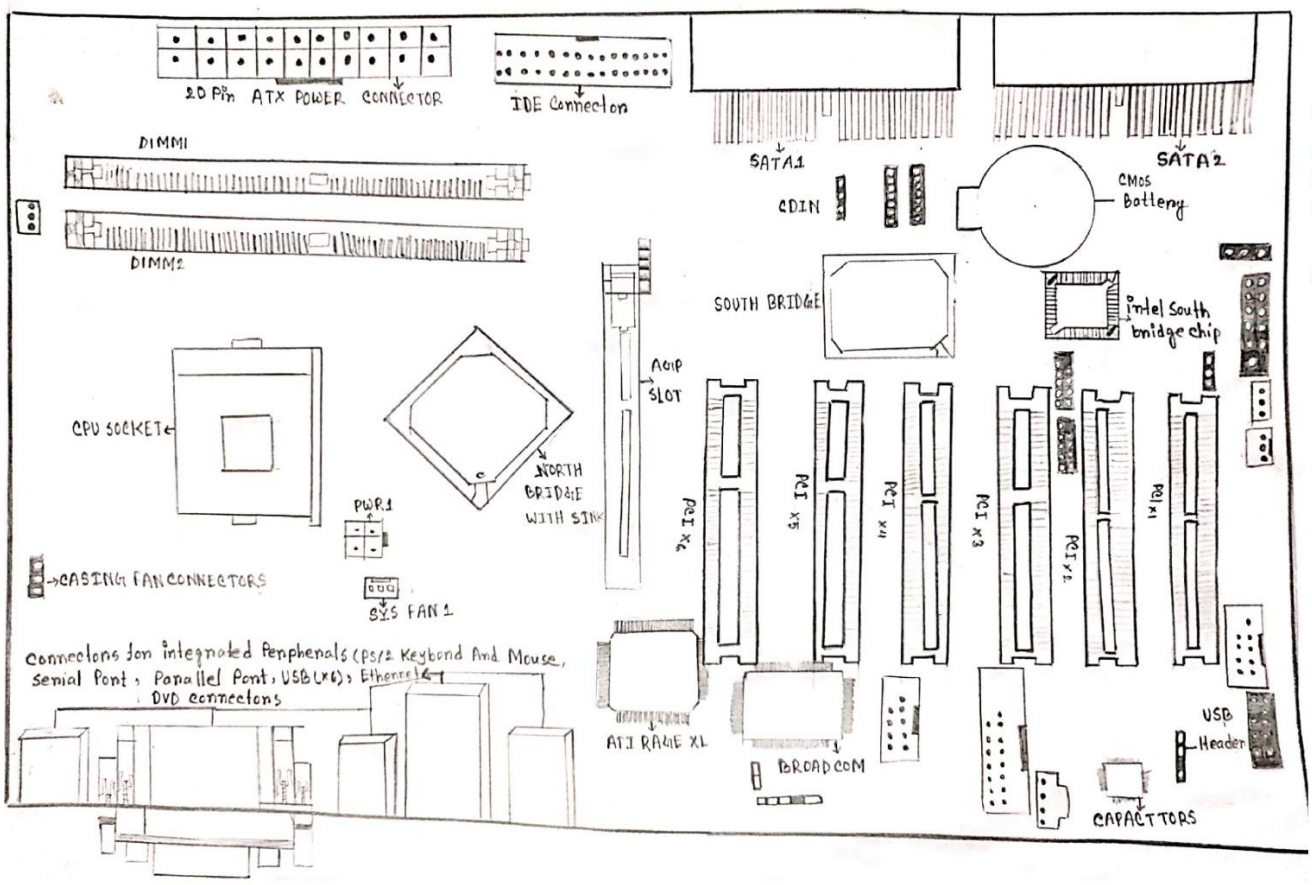
Component	Photo	Feature	Types
CPU Connector		Allow current to flow to power the device	4 Pin Peripheral Power Connector, ATX 20 Pin Power Connector, 6 Pin PCI Express Power Connector etc.
Heatsink		The heat generated by electronic or mechanical equipment (especially CPU) is transferred to the fluid medium (usually air cooling, more advanced water cooling), and the heat is radiated from the equipment to maintain the temperature of the equipment. Has a large surface area to ensure effective cooling.	Passive Heat Sink, Active Heat Sink, Aluminium Heat Sink, Copper Heat Sink, Solid Metal Heatsink, Pumped Liquid Heatsink.
PCI (Peripheral Component Interconnect)		Interface used to connect other internal components (such as graphics card, Wifi card or SSD) to a desktop computer.	PCI, AGP, PCI Express.
Memory Module/ RAM (Random Access Memory)		Volatile memory. Store temporary data when the computer is started or running. After turning off the computer, data will be lost.	TransFlash Memory Module, SIMM (single in-line memory module), DIMM, (dual in-line memory module), Rambus memory, SO-DIMM (small outline DIMM).

CPU Socket		Provide mechanical and electrical connections between the microprocessor and the printed circuit board (PCB), and allow the central processing unit (CPU) to be placed and replaced without soldering.	Pin grid array (PGA), Staggered Pin Grid Array (SPGA), Plastic Pin Grid Array (PPGA), Micro Pin Grid Array (µPGA), Flip Chip Ball Grid Array (FCBGA), Land Grid Array (LGA)
IDE(Integrated Drive Electronics)		The electronic interface between the data path or bus of the computer motherboard and the computer disk storage device. Earlier than SATA standard.	
IDE(Integrated Drive Electronics) cable		Used to connect certain hard drives and optical drives to the motherboard. Older than SATA standard.	34-pin cable, 40-pin cable etc.
Graphics Card		Render the image on the monitor; it is responsible for presenting the image to the monitor by converting the data into a signal that the monitor can understand. It is usually best to handle thousands of cores, because image rendering is best run in parallel.	Types: PCI, AGP, and PCI Express. Models: Nvidia GeForce RTX 2080 Super, AMD Radeon VII, Nvidia Quadro RTX 4000 etc.

CPU(Central Processing Unit) or Processor		Receive and process basic instructions that allow the computer to run; responsible for the interpretation and calculation of most computer commands	Types: Microcontroller, Microprocessor, Embedded Processor, DSP and Media Processor. Models: AMD Ryzen 9 3950X, Intel Core i5-10600K, AMD Athlon 300GE.
PSU (Power Supply Unit)		Converts mains AC to a lower-voltage regulated DC power for the proper powering of internal components in a computer.	
CD ROM		A type of computer memory in the form of an optical disc, which can be read optically.	Types: standard manufactured CDs (CD-DA), CD-R (recordable) and CD-RW (rewriteable).
USB cable		This interface is mainly used to connect the computer to peripheral devices such as a mouse, keyboard, camera, printer, and scanner.	USB-A, USB-B, Mini-USB, Micro-USB, USB C, Lightning Cable etc.

Serial Advanced Technology Attachment or SATA cable		Serial ATA cables are used to connect devices in computer cable assemblies. Newer and faster than the old IDE interface	Micro SATA, SATA Bracket, SATA Bridge, SATA Power etc.
Hardware Disk Jumper		Used to enable specific types of settings.	

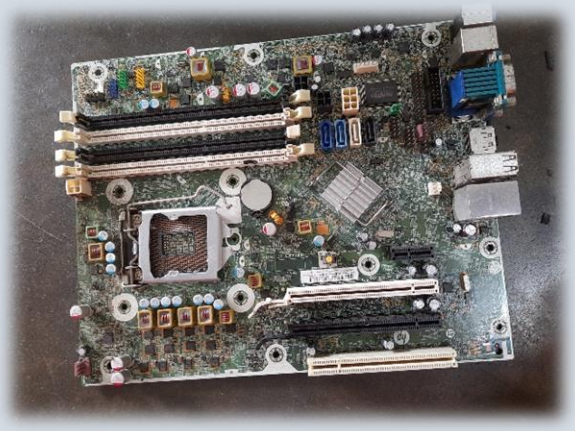
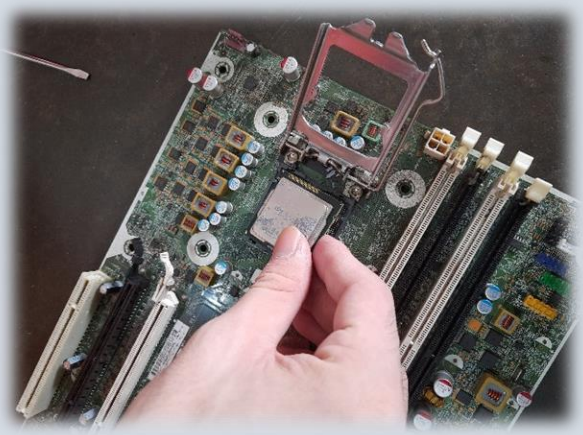
PART B – Sketch of a mother board layout



Part C: Step by Step PC Assembly

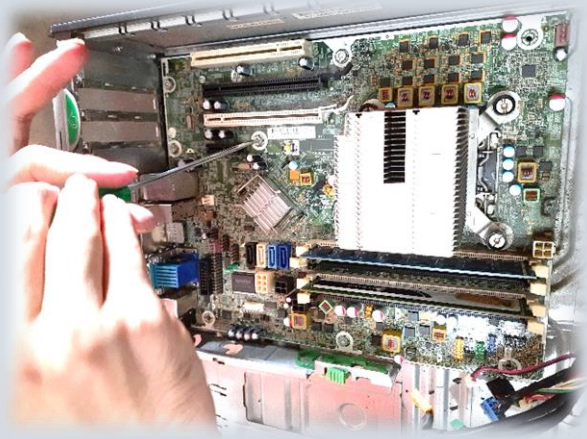
PC Used: HP Compaq Elite Small Form Factor Desktop

Photos	Steps	Description
  	Opening the Computer casing	1. The side cover (if any) must be unscrewed first. Place the side cover on a flat surface. *PS: The side cover of the computer we use is fixed by thumb screws. Therefore, it is easy to unscrew by hand. The case can be easily opened with the included handle.*

  	Motherboard (Processor / CPU)	1. First lift the latch lever of the CPU socket. 2. Then gently place the processor and align the alignment slot of the processor with the triangle marked on the processor socket to ensure the correct orientation. 3. Slowly lower the CPU latch lever to secure and lock the processor in place. 4. Apply thermal paste to ensure that the processor is in contact with the heat sink to prevent overheating.

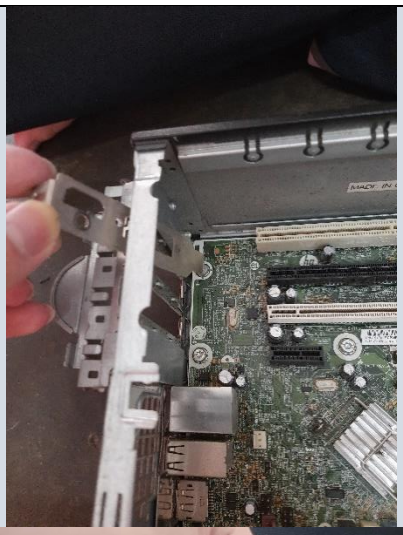
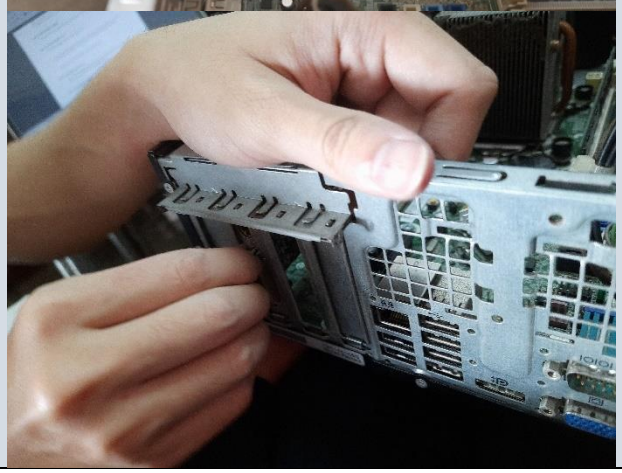
 		
 	Motherboard (Heat Sink)	1. After applying thermal paste, we can now install the radiator. 2. Place the heat sink on top of the processor socket in the correct orientation. 3. Tighten the four screws of the radiator to fix it in place. *PS: This type of PC has a built-in radiator cooling fan on the front of the computer. The radiator*

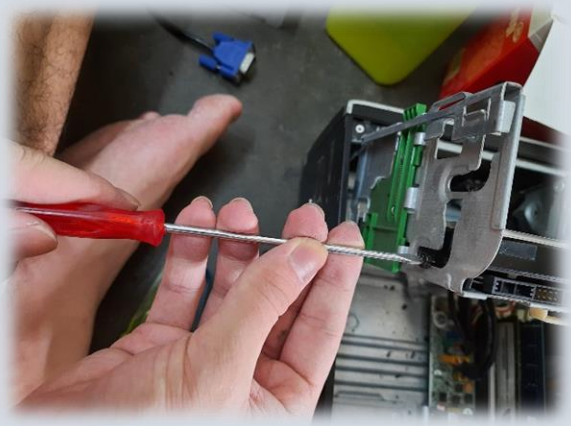
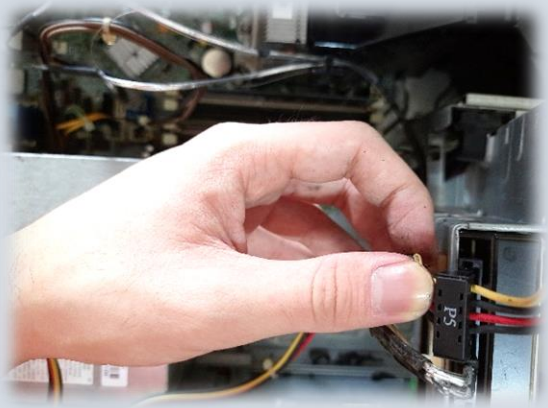
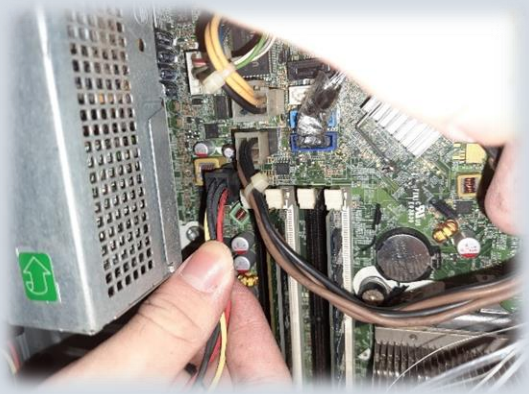
		will be connected to the fan through a plastic "tunnel" which will be installed later.
 	Random Access Memory (RAM)	1. Easily open the two clips of the RAM installation slot by hand. 2. Make sure that the RAM is aligned correctly by checking the notch of the RAM and the slot itself. 3. Press down to insert the RAM into the slot until you hear a "click" sound from the installation slot, indicating that the RAM has been locked in the slot by the retaining clip.

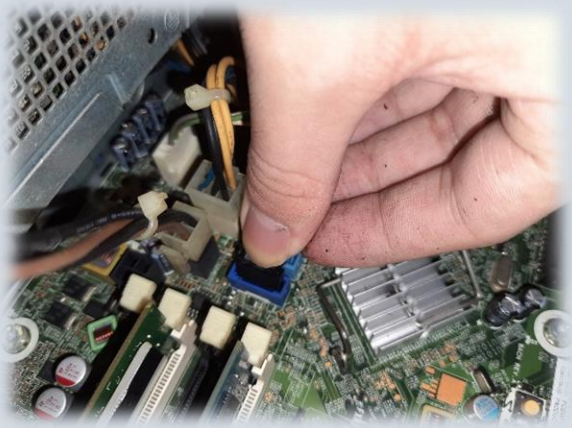
 	Mounting Motherboard onto the Computer Case	1. Put the motherboard into the computer case in the correct direction according to the I/O board ports and mounting screw holes. 2. Tighten the motherboard to fix it in place. Make sure the I/O port is correctly oriented on the back of the enclosure 3. Connect the cables of the front PC I/O (power button, audio port...) and cooling fan (depending on the PC model) to the motherboard connector through the cables provided with the case.

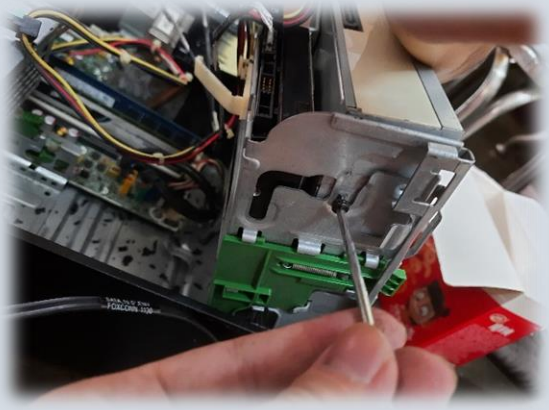
 		

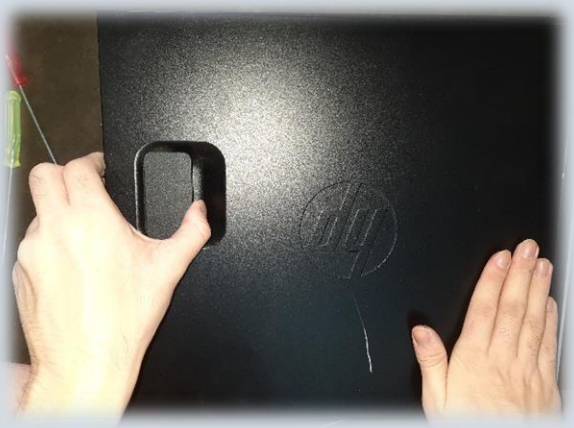
 	Power Supply	1. Place the power supply ("Commall" is located on the upper rear part of the computer case) and tighten it as needed to fix it in place. 2. Connect the power cable (2 x 4-pin connector in this case) to the motherboard in order to power the motherboard properly.

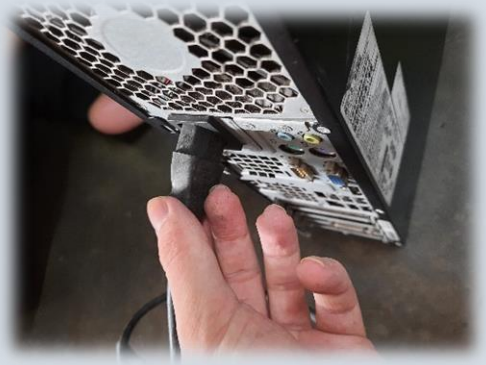
  	Graphic Card (Nvidia GT 1030 2GB Low Profile)	1. Install the bracket that came with the graphics card on the back of the computer. 2. Align the graphics card with the PCI expansion slot on the motherboard. Gently press down to install the graphics card. 3. Tighten to secure the graphics card in place *PS: Some GPUs with higher power may require higher power. In this case, the GPU will need to connect the power cord directly to the graphics card*

   	Disk Drives	1. Place the hard disk in the case drive bays. 2. Screw through the case frame into the case mounting holes on the storage drive to fix the disk drive in place. 3. Connect the hard disk with the power. 4. Connect the hard disk to the motherboard through SATA cable. *PS: Older models may use IDE cables instead*

   	CD ROM	1. Place the CD ROM correctly in the chassis panel, and the CD reader interface is located on the front of the computer. 2. Screw the case frame into the case mounting hole of the CD ROM to fix it in place. 3. Connect the CD ROM to the power cord. 4. Connect the CD ROM with a SATA cable, and connect the other end to the corresponding port on the motherboard.

		
 	Closing the Case	1. Put the side cover back in place. 2. Screw back to fix the side cover.

   	Connecting Peripherals	1. Use the power cord to connect the CPU to the wall outlet. 2. Connect the CPU to the monitor by inserting a display port (such as VGA, DVI. DisplayPort or HDMI) 3. Connect peripheral devices (including keyboard, mouse, wireless network dongle, printer and web camera) to PC via USB port. 4. Connect the speaker and microphone with a 2.5mm socket.