Assembling and Disassembling PC

INTRODUCTION

❖ Computer assembly is an essential job of a computer installation technician. The technician has to work in a logical, methodical manner while handling various computer components and peripherals. The technician can improve the computer assembly skills with practice. Computer assembly is a process in which all the internal components required for the computer system are fitted so as to make the computer functional

we can identify the components correctly

Computer Assembly

➢ As we know, computer assembly is a systematic process. First, arrange the computer parts. The sequence for assembly and working of the computer listed below is as:

1. Open the case.
2. Install the power supply.
3. Attach the components to the motherboard.
4. Install the motherboard.
5. Install internal drives.
6. Connect all internal cables.
7. Install motherboard power connections
8. Connect external cables to the computer.
9. Boot the computer for the first time.

❑__Material required__

▶ Computer case, with power supply installed

▶ Motherboard

▶ CPU 34

▶ Heat sink/fan assembly

▶ Thermal compound

▶ RAM module(s)

▶ Motherboard standoffs and screws

▶ Anti-static wrist strap and anti-static mat

▶ Tool kit

we can identify the components correctly

Step 1: Open the case

➢ The method for opening the case is different based on the manufacturer. To open the case, first remove the screws of the left side cover and slide the side cover.

Step 2: Install the power supply

➢ The next step is to install a power supply. There are usually four screws that attach the power supply to the case.

- • Insert the power supply into the case.
- • Align the holes in the power supply with the holes in the case.

Step 3: Attach the components to motherboard

➢ The motherboard has to be prepared before its installation. To prepare the motherboard, you first need to install the CPU, then the heat sink on the CPU and CPU fan
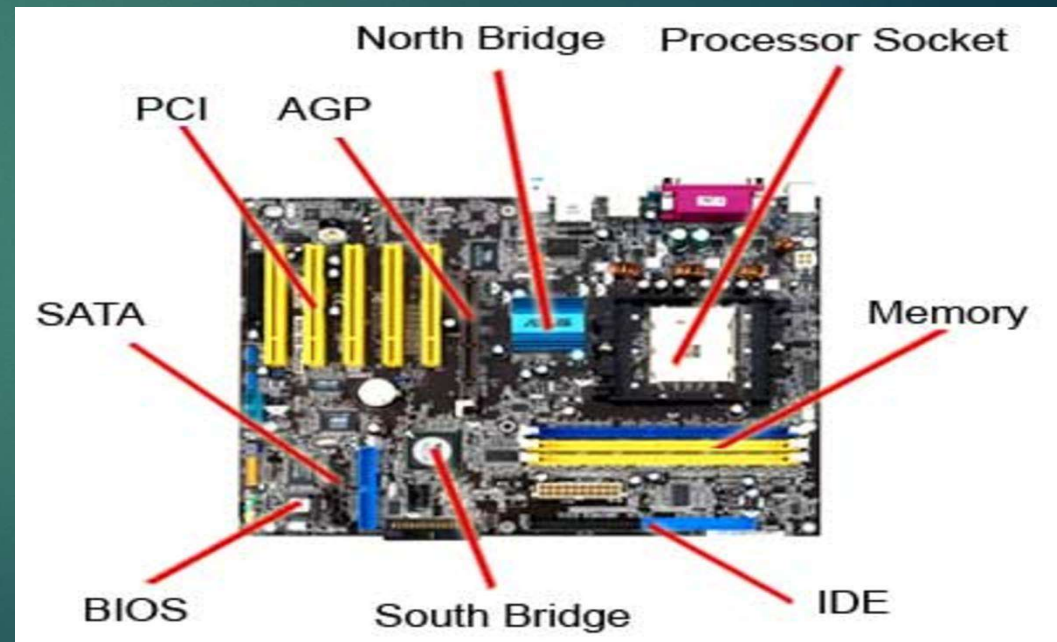
CPU

➢ The CPU and motherboard are sensitive to electrostatic discharge. So place them on a grounded antistatic mat and wear an anti-static wrist strap while handling the CPU. When handling a CPU, do not touch the CPU contacts at any point

➢ Thermal compound which is used to conduct heat away from the CPU is applied on the top of CPU.

❖ Heat sink and fan assembly

➢ To install a CPU and heat sink and fan assembly, follow these steps:

- First, open the CPU load plate. Align the CPU orientation so that the notches on the CPU are aligned with the orientation keys on CPU socket..
- Screw the CPU fan on the heat sink.
- Align the heat sink and fan assembly with the holes on the motherboard.
- Place the assembly onto the CPU socket carefully.
- Screw the assembly on the motherboard.
- Connect the assembly power cable to the CPU fan connector on the motherboard

Installation of RAM

➢ It is better to install the RAM first on the motherboard and then fix the motherboard in the case. To install RAM, first ensure its compatibility with the motherboard.

• Press down the side locks of the memory slot. Align the notches on the RAM module to the keys in the slot and press down on both ends of RAM module until the side lock gets locked.
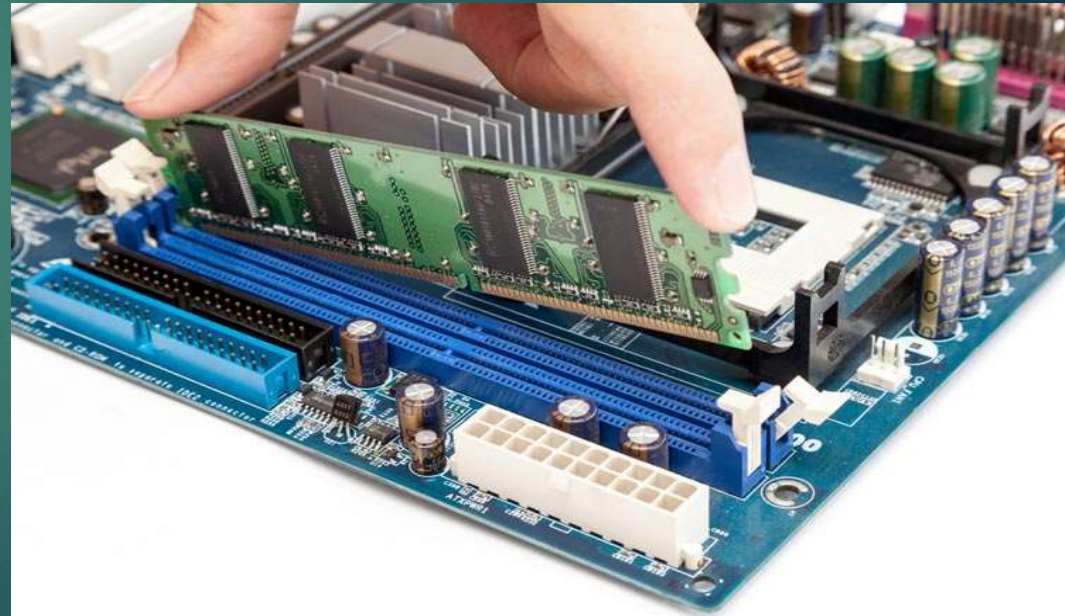
Step 4: Install motherboard

▶ Lay the motherboard over the standoffs to mount it on the holes.

• Align the screw holes of the motherboard with the standoffs.

• Then screw the board using a standard screwdriver.

• Tighten all the motherboard screws.

• Connect the 4-pin ATX power connector from the power supply to the motherboard.
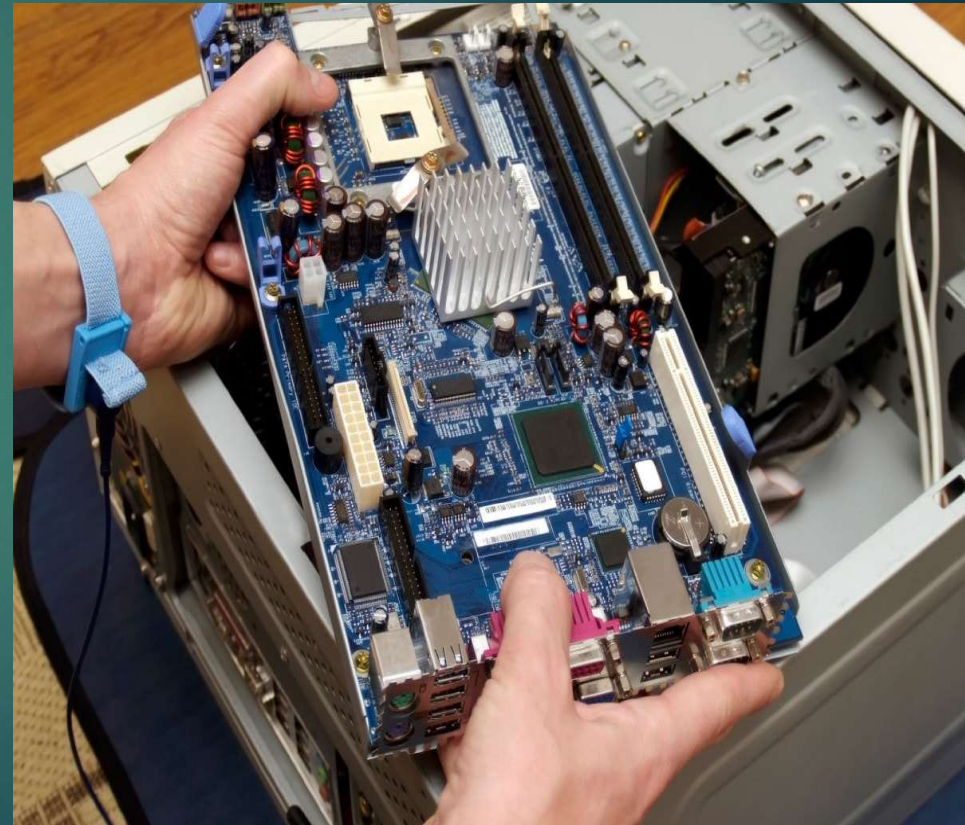
Step 5: Install internal drives

➢ **Hard drive**

The hard drive is the device which stores all the data. A hard disk drive (HDD) is an example of an internal drive.
To install HDD, follow these steps:

• Position the HDD so that it aligns with the 3.5-inch drive bay
• Insert the HDD into the drive bay so that the screw holes in the drive line up with the screw holes in the case .
• Secure the HDD to the case using proper screws.

➢ **Optical drive**

• Insert the optical drive into the drive bay so that the optical drive screw holes align with the screw holes in the case.

• Secure the optical drive to the case using the proper screws.

• Connect the power cable coming from the SMPS to the power socket of optical drive.

• Connect SATA data cable motherboard socket.

Step 6: Connect all internal cables

➤ Power cables are used to distribute electricity from the power supply to the motherboard and other components. Data cables transmit data between the motherboard and storage devices, such as hard drives.

Step 7: Install motherboard power connections

➤ Follow these steps for motherboard power cable installation

• Align the 20-pin ATX power connector with the socket on the motherboard.
• Gently press down on the connector until the clip clicks into place.
• Align the 4-pin AUX power connector with the socket on the motherboard.
• Gently press down on the connector until the clip clicks into place.

• Align the 20-pin ATX power connector with the socket on the motherboard

• Align the 4-pin AUX power connector with the socket on the motherboard.
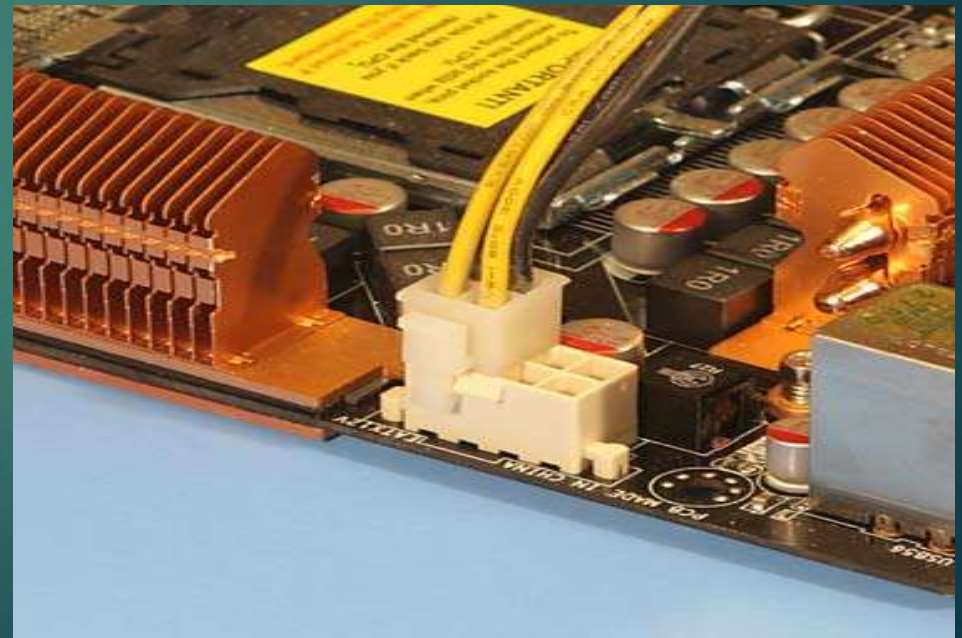
Step 8: Connect external cables to the computer

➤ Setting up the computer system involves the complete process of establishing the proper connectivity of various parts of the computer system — input and output devices, connectivity of computer with the surge power supply. Reattach the side panels to the case. The process of connecting the external cables given below:

Locate the monitor cable

- The VGA cable is used to connect to monitor and another point on to the back side of the cabinet
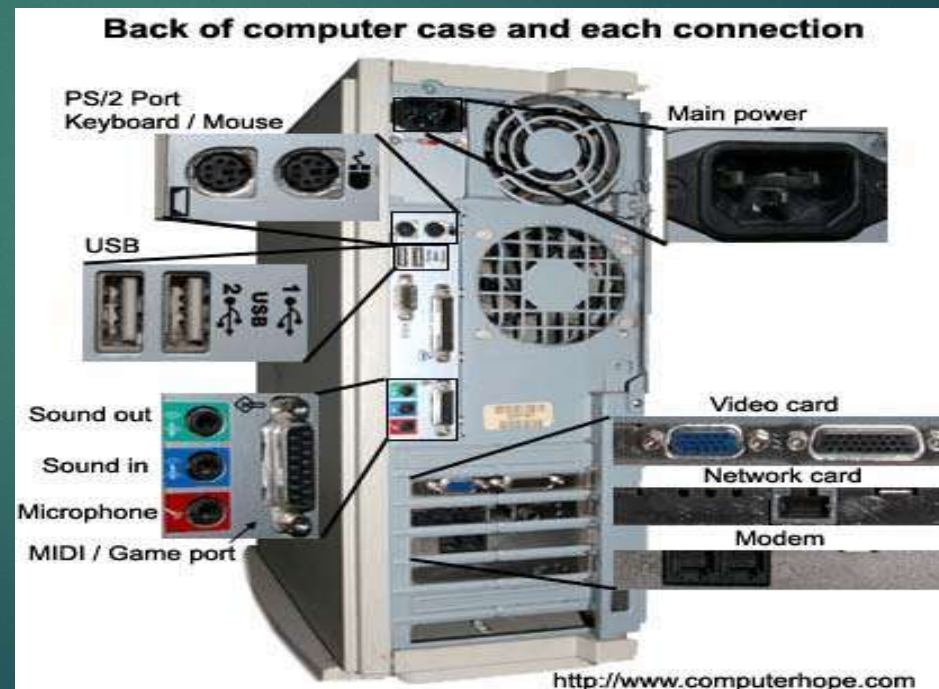
❑ Connecting monitor

- Connect one end of the cable to the monitor port on the back of the computer case and the other end to the monitor. In case of VGA cable and tighten the screws on the monitor cable to secure it.
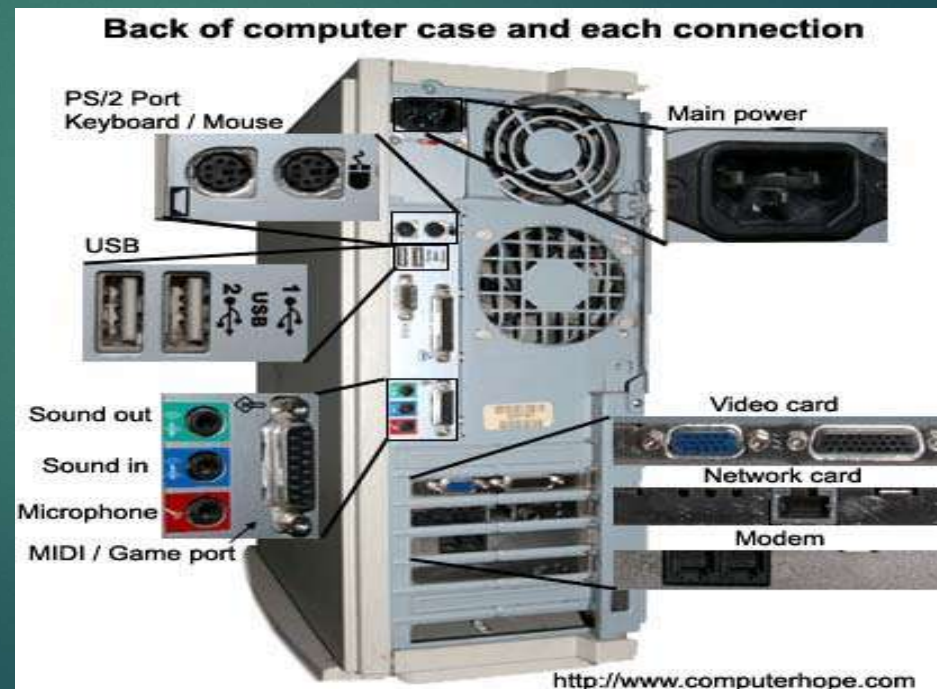
❑ **Connecting keyboard**

▶ Connecting keyboard Unpack the keyboard and determine whether it uses a USB (rectangular) connector or a PS/2 (round) connector.

❑ **Connecting mouse**

▶ Connecting mouse Unpack the mouse and determine whether it uses a USB or PS/2 connector. If it uses a USB connector, plug it into any of the USB ports on the back of the computer.

Back of computer case and each connection

PS/2 Port Keyboard / Mouse
Main power
USB
Sound out
Sound in
Microphone
MIDI / Game port
Video card
Network card
Modem

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▶ **Connect the computer to a power supply** Locate the two power supply cables that came with the computer. Plug the first power supply cable into the back of the computer case and then into a surge protector. Then, using the other cable, connect the monitor to the surge protector. It is better to use an uninterruptable power supply (UPS), which acts as a surge protector.

- **<u>Checklist the following before starting the computer :</u>**

• VGA cable of monitor is connected to the cabinet or not.

• Power cable of monitor and cabinet has been plugged into the UPS power output socket. Make sure monitor is connected to the power supply or not.

• Keyboard and mouse both are connected to their proper ports.

Step 9: Starting the computer

➤ To start the computer, it is necessary to follow the correct sequence to start up. Now push the power button on the CPU to start the computer. Practically when we start our vehicle, we always check that the light or air conditioner (AC) is off. Otherwise, it will consume more power compared to normal start up.

Assemble done

Computer Disassembly

➤ Disassembly is the process of breaking down a device into separate parts. Disassembly of any device is required to determine a problem, to replace a part, or take the parts and use them in another device. A computer is also an electronic device which requires disassembly for such issues.

Material Required

- One working PC
- An anti-static wrist strap
- An anti-static mat
- Anti-static bags of various size
- Technician's toolkit
- A plastic cup or box to organise screws, nuts, and bolts

Step 1: Unplugging

- Unplug the power cord from the PC and from the wall socket to prevent any injuries and damage of the PC from electrostatic discharge (ESD).

- Unplug all the peripherals attached to the computer, such as the keyboard, mouse, monitor, headphones, and any external drives.

- Wear a grounding strap to discharge any static electricity.

Step 2: Open the case

- To open the case, first remove the screws of the left side cover and slide the side cover. Pull the latch to release the side panel. Then lift the side cover out from the chassis.

Step 3: Disconnect all the connectors

▶ Disconnect all the connectors connected to the motherboard. These include SATA power cable and data cable of HDD as well as SATA cable of optical drive

Step 4: Remove the fan

▶ Remove the fan now. Most computers have two fans — the system fan and CPU fan. The system fan is located at the back side of the computer to blow air into the computer

Step 5: Remove the power supply

▶ The power supply is connected to the motherboard by a 20-pin connector and 4-pin connector. It is also connected to hard disk drive and the optical drive. Firstly, disconnect hard disk drive and the optical drive connectors from the motherboard.

- Disconnect the power cable of the hard disk and optical drive which connects to the SMPS
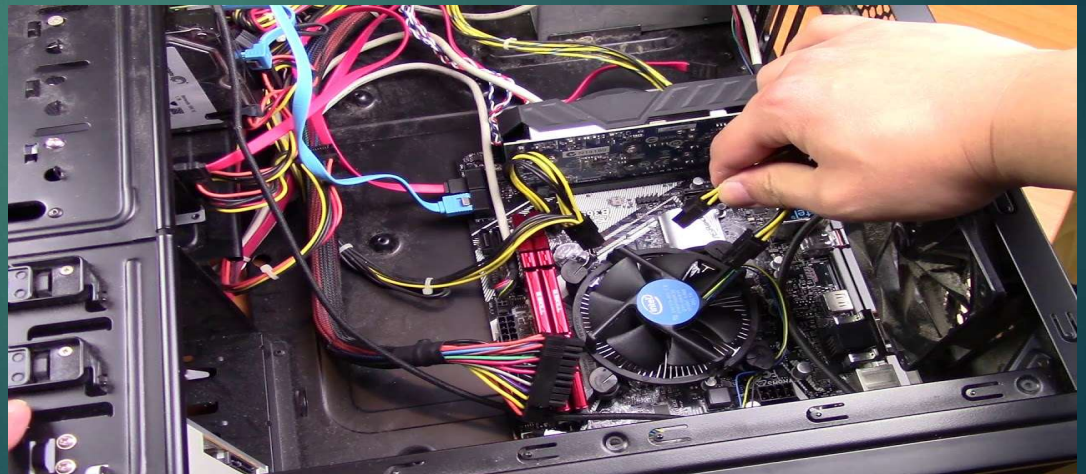
Step 6: Removing HDD and optical drive

▶ Remove the SATA cable connecting to the HDD and motherboard. Then unscrew the four screws securing it in place and pull out the HDD.

Step 7: Remove RAM (random access memory) modules

- RAM allows for the transfer of information to and from the CPU. Computer runs fast with more RAM. Most computers have four RAM slots, and two RAM chips. To remove the RAM, push down on both tabs holding the RAM in place, which are located at both ends of the RAM. It will cause the module to pop up for easy removal.
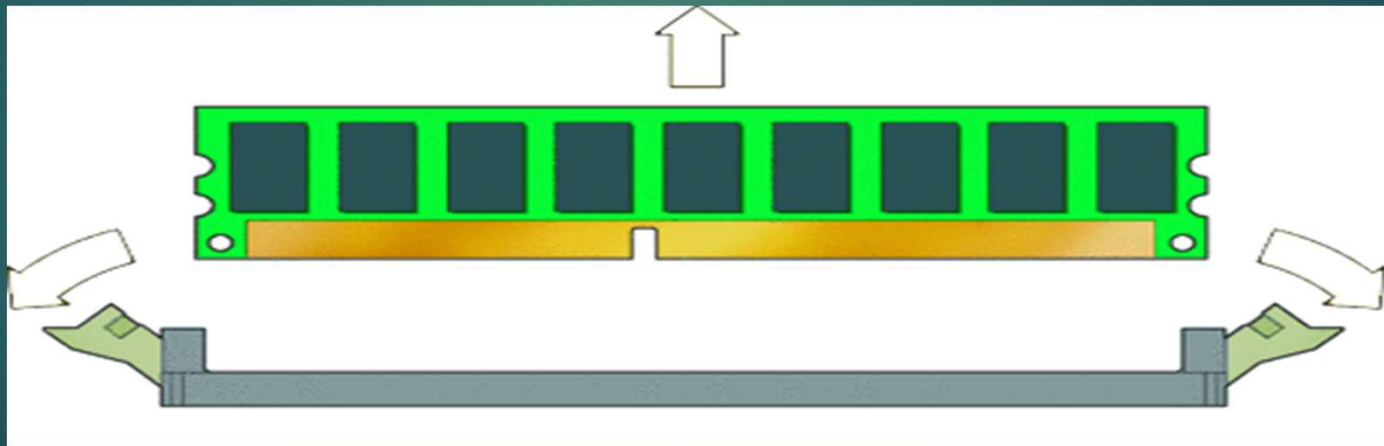
Step 8: Remove expansion cards

➤ The modern motherboards are integrated with the audio, video and network cards. However, if your computer has the expansion card insert into the expansions slot to increase the functionality.

• To remove the expansion cards, disconnect the cables attached to it.
 • Remove the screws securing the card in the slot.
• Carefully take out the card from the slot

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Step 9: Remove motherboard

► Every part of the computer is attached to the motherboard. The CPU, RAM, and expansion cards are directly attached to the motherboard. To remove the motherboard, disconnect all the cables from the motherboard. It has seven screws holding it to the frame. Remove these screws and then lift the motherboard out of the frame.
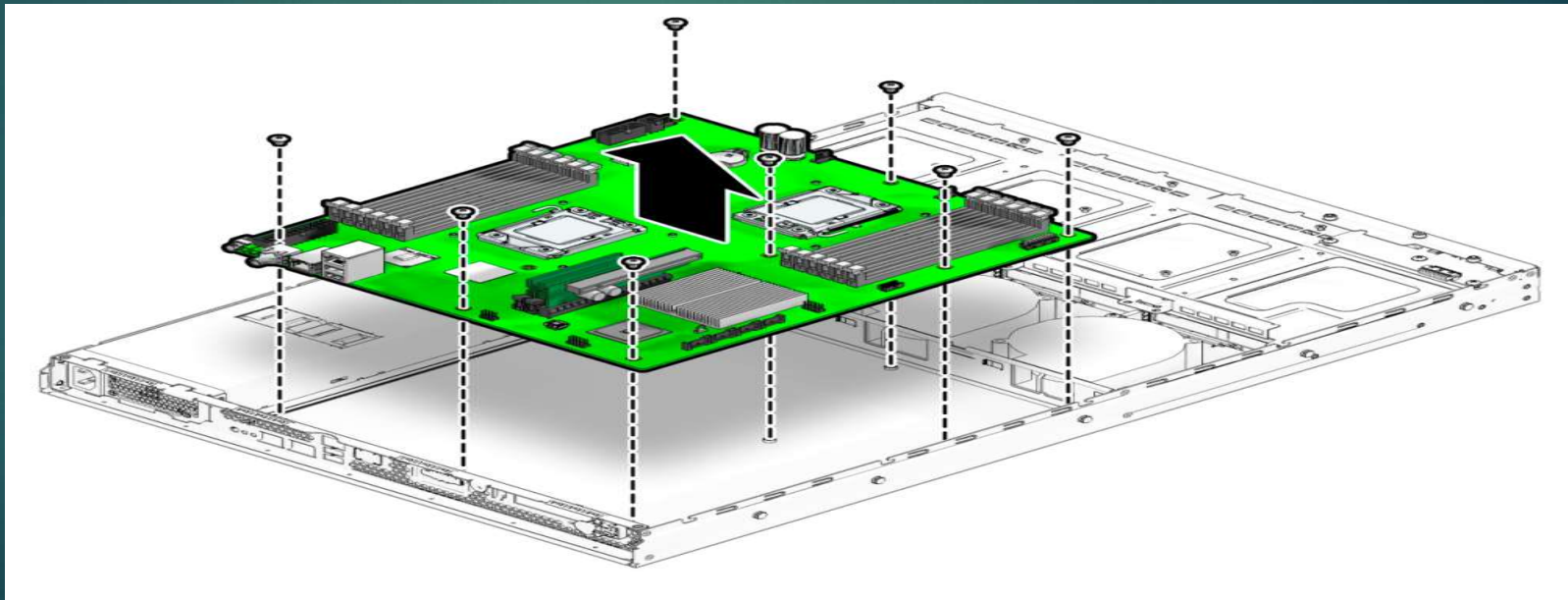
Step 10: Reassemble the components

- Identify every component and take its photograph.
- After identification of each component, put all the components back in their place and ensure that all cables and wires are connected at the right place to avoid further troubleshooting.
- Close the case and put the screws back in their place.
- Lastly, connect every external device such as the keyboard, mouse, monitor, etc., and turn on the computer to see everything is working fine after assembled.

Thanks