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**Assignment: Step by step PC Assembly**

**Submitted to \ Dr GOH**

**Submitted by \ group members**

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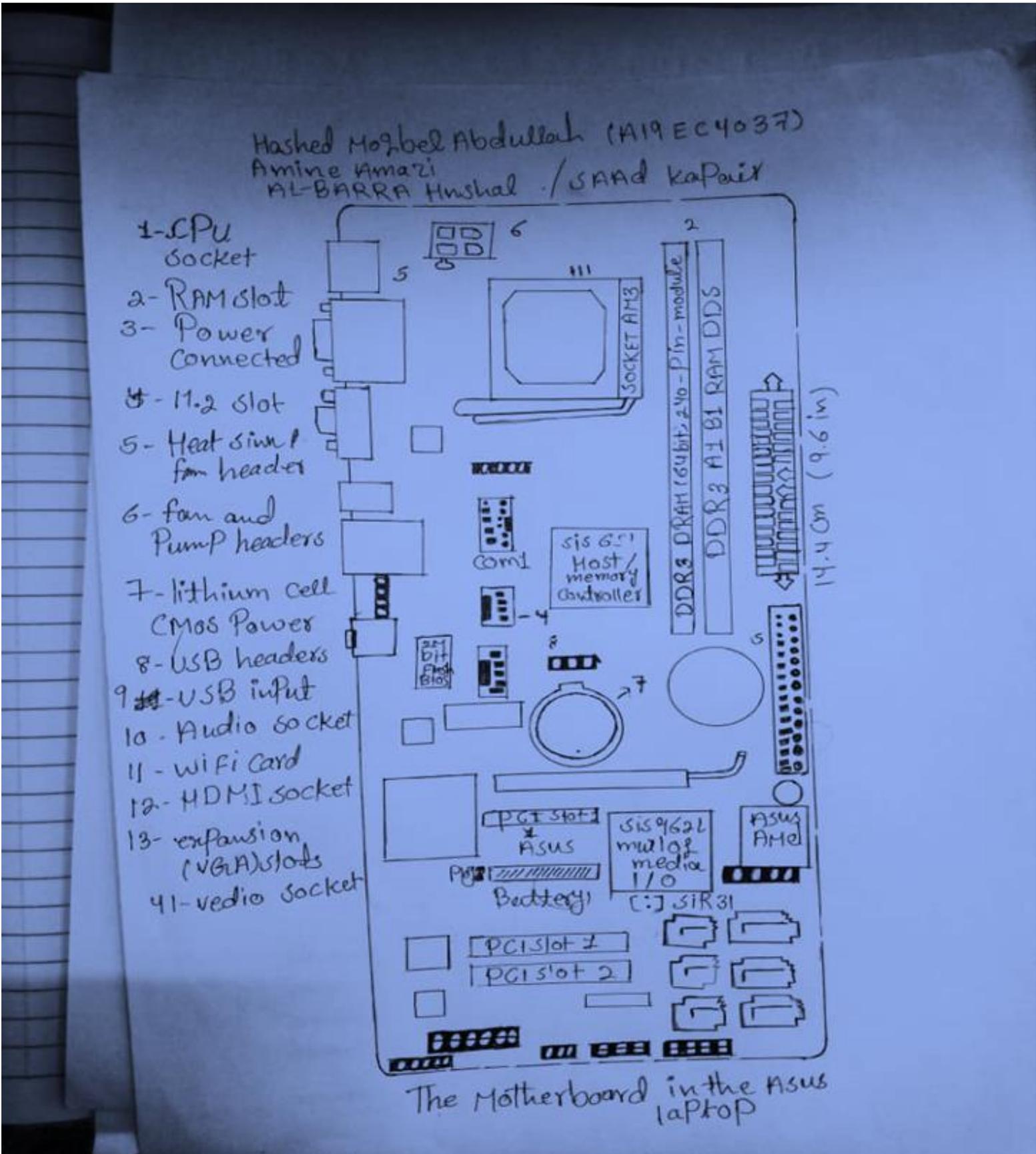
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# Installing PC step by step

## PART A

### 1.0 Motherboard Drawing Diagram



The motherboard is the spine of your whole PC, associated with each other component, so it's imperative simply get things right presently to dodge inconvenience encourage down the line.

## Some point we must know before installing motherboard in PC

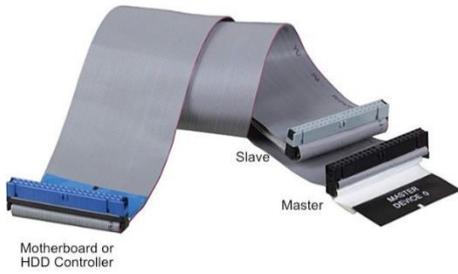
On the off chance that you need the method to go smoothly, there are many things you'll be able do some time recently ever unloading the motherboard. First, plan your workspace – This implies cleaning your workspace to ensure that it is free of any tidy or flotsam and jetsam. Uncovered mechanical components are delicate to particles within the environment. Of course, it is likely self-evident to move any fluids or clutter, but a dust-free environment is optimal. Next, assemble your devices – Another likely self-evident tip for prepared people, assemble and organize the instruments you'll require. A Phillips Head screwdriver, tweezers, and indeed little zip ties are things you don't need to hunt for whereas holding the motherboard in place. Presently, consider security – We are not talking around your security (of course it's a great thought to form beyond any doubt your control supply isn't associated with anything to dodge an electrical stun). We are talking about your motherboard's security. Once more, a few prepared clients say they have never utilized ESD groups or mats and have never had an issue. In any case, a few of us feel its way better to be secure than too bad. Utilizing elastic gloves (no powder) anticipates any oils from your hand harming the components whereas an ESD band or tangle will anticipate inactive power harm.

## Unpack the board

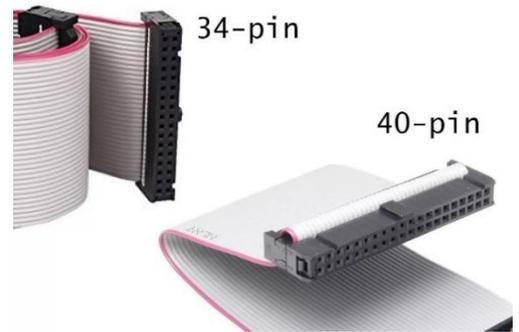


Open your motherboard's box. You will see parcels of cables, a driver CD, a metal blanking plate with gaps cut out, and a manual. Take these components out and put them to one side, as you will require them afterward on. The motherboard will be interior and anti-static sack and resting on best of anti-static froth. Slide the motherboard out of the pack but take off it connected to the froth for presently. Put the motherboard and froth on the beat of the anti-static sack and take out the metal blanking plate.

## 2.0 Components Explanation



IDE cables used to connect some hard drives and optical drives to each other and to the motherboard. The two most used types of IDE ribbon cables are the 34-pin cable used for floppy drives and the 40-pin cable for hard drives and optical drives.



floppy drives and the 40-pin cable for hard drives and optical drives.

## Measure blanking plate



The blanking plate fits into the case and gives you get to as it were to the ports that your motherboard has. In any case, a few motherboard producers utilize nonexclusive blanking plates that fit their whole extend of sheets. With these, you will have to evacuate a few metal covers to deliver get to your motherboard's ports. The least demanding way to see is to hold the blanking plate up to the motherboard until the set patterns coordinate the ports on your board. The blanking plate ought to be pushed against the motherboard with the edge indicating out, so any content is readable. It'll as it was fit one way, so move it until it's the proper way. Make a note of any ports that are secured

drives and the 40-pin cable for hard drives and optical drives.



USB Type A

USB Type B

USB 3.0

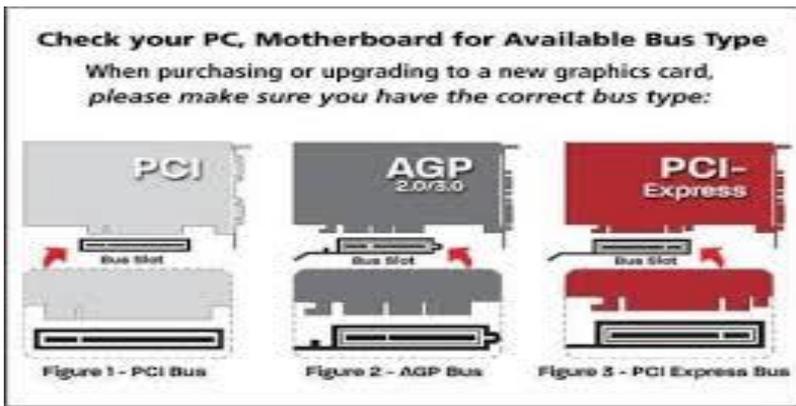
USB Mini

USB Micro

USB Type C

USB Micro B

Graphic card produces the image you see on a monitor. It also responsible for rendering an image to your monitor. Graphic Video cards come in three different connector types. There are PCI, AGP, and PCI Express.



Universal Serial Bus (USB) cable are used to connect from computer units to perpheral devices (mobile phones, camera, camcorders, printers or scanners). The main function is to effectively and quickly gather or transfer data from one device to another.

The function of heat sink is to flow away the heat from a hot devices, so that the

performance of the desktop is will be stable. It accomplished by increasing the device's working surface area and the amount of low-temperature fluid that moves across its enlarged surface area. We can divide the type of it by two type, whether it's active or passive, and is it material from aluminium or cooper.



Central processing unit is known as CPU or processor is a main part of any digital computer system. The processor is also called the brain of any system which incorporates computers, laptops, smartphones, embedded systems, and so on. The main functions are fetching, decoding, executing, and write back the operations of an instruction. There are five types of general-purpose processors they are, Microcontroller, Microprocessor, Embedded Processor, DSP and Media Processor.

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(Compact Disc-Read Only Memory) A type of CD disc or storage that can only be read, but not recorded. Used to store programs and data files, it holds only about 650MB - 700MB.

Active Heat Sink



## Remove unnecessary bits



In case you wish to expel any parts of the blanking plate, you ought to do that presently. You will have two options for doing this. To begin with, you will evacuate a bit of metal, in a comparative way to the metal blanking plates on your case. These ought to be shaken tenderly out until the metal snaps. Second, a few ports may be secured by a fold. In this case, the fold ought to be bowed inwards (towards where the motherboard will be). Make beyond any doubt simply twist it distant sufficient for the motherboard's harbour to be given sufficient clearance to pass underneath.

## 4. Install the blanking plate



From the inside of the case, you need to take the blanking plate and push it into the gap at the rear of the case. Remember to align it so that it's the same way up as when you measured it against your motherboard.

The ridge around the outside of the plate should clip into the hole. Be warned that this can be really fiddly and the blanking plates don't always fit perfectly. It should, however, clip into place and remain stable without any support.

## 5. Measure where the motherboard goes



Next, you will need to see where the screw holes for your motherboard and where will go. Lie the case flat on the desk and make sure that all the internal cables are out of the way. When you've got a clear case, take the motherboard off its foam backing and slide it gently into the case. Make sure that its rear ports are pushed up against the blanking plate correctly. Take a note of where the screw holes in the motherboard go and remove the board. Place it back on its foam.

## Fit the risers



You would like to fit risers were you famous the screw gaps. These will be included with the case and see like tall copper screws. Their work is to hold the motherboard off the foot of the case, so it isn't shorted out when its contacts touch the metal. The risers simply screw into the pre-drilled gaps within the case. Use as numerous risers as there are screw gaps within the motherboard, making beyond any doubt that you just screw them firmly into position along with your fingers.

## Slide the motherboard into place



Put the motherboard back within the case, making beyond any doubt that all its screw gaps have risers underneath. On the off chance that some are lost, check to form beyond any doubt that you simply haven't screwed the risers into the off-base put. You'll probably take note that the motherboard features an inclination to be somewhat off from the risers. Usually ordinary and is caused by weight from the backplate pushing against the motherboard. Essentially line up the motherboard's ports with the backplate and thrust the motherboard towards it until the screw gaps line up. This will take a bit of tender constrain.

## Screw the motherboard down



With the motherboard input, you'll be able to begin to screw it in. Begin with the corners, holding the motherboard solidly, so that its screw holes line up with the risers simply put. When screwing the screws in, don't utilize as well much weight as you don't need to break the motherboard. In a perfect world, you need the screws tight sufficient for the board to be secure, but not so tight that it feels as though the board is reaching to begin cracking. Once you've done the corners, you'll be able to put screws within the other gaps. How numerous you put in is up to you, but you shouldn't have to be do all of them to form the motherboard secure. Keep going until the motherboard is solidly input.

	DIMM Type	Size (L x H mm)	
DDR4	Standard		133.35 x 31.25
	VLP (Very Low Profile)		133.35 x 18.75
DDR3	Standard		133.35 x 30
	VLP		133.35 x 18.28 to 18.79
DDR2	Standard		133.35 x 30
	VLP		133.35 x 18.28 to 18.79
DDR	Standard		133.35 x 30
	VLP		133.35 x 18.28 to 18.79
SDRAM	Standard		133.35 x 25.4 to 43.18

Random Accessible Memory or RAM is an essential part of a computer’s hardware because it stores data for programs when they are processed by the CPU. The data only stored temporary (short term), so when we turned off the PC, data which stored in RAM will be closed. And there are several types of RAM : SRAM (Static random-access memory), SDRAM (Synchronous DRAM), and DDR SDRAM, which DDR refers to *double data rate*. And DDR comes with 4 models, DDR only until DDR4.

### Identify ATX connectors



With the motherboard input, you are prepared to put through it to the control supply. There are two connectors that you’ll have to be plug within. Then, to begin with is the ATX connector. On advanced motherboards, you would like a 24-pin connector. There is as it was one of these on the power supply. However, as more seasoned motherboards as it was required a 20-pin connector, there is ordinarily a four-pin connector that can be confined. Make beyond any doubt that usually associated which you've got an unbroken 24-pin connector.

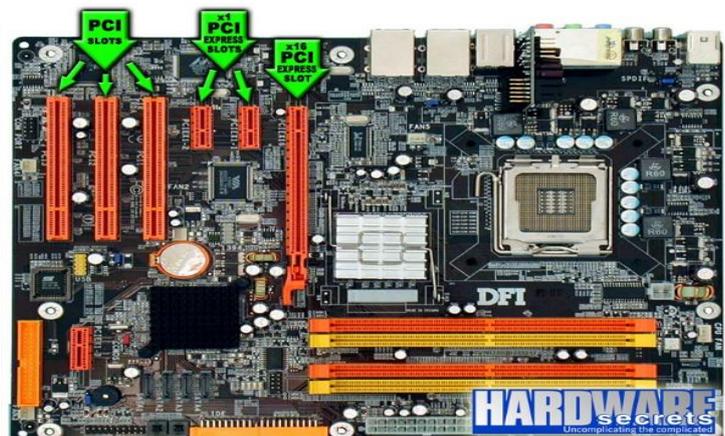
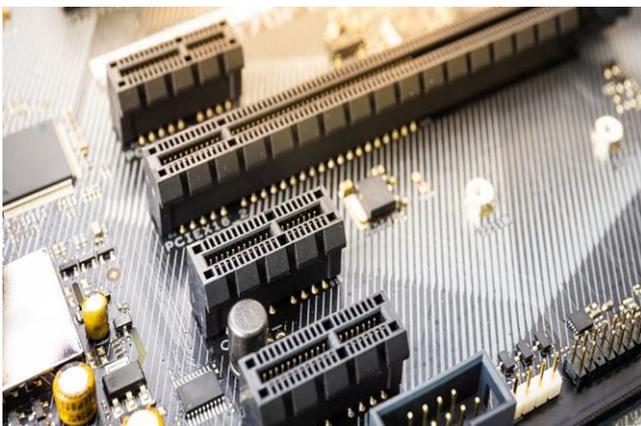


Hard disk is the main components to store data for long-term period, or permanently. The amount of the data that can be stored is depend on the capacity of the hard disk itself. SATA (Serial Advanced Technology Attachment), HDD (Hard Disk Drive), and SSD (Solid State Drive) are the types of hard disk which commonly used right now.



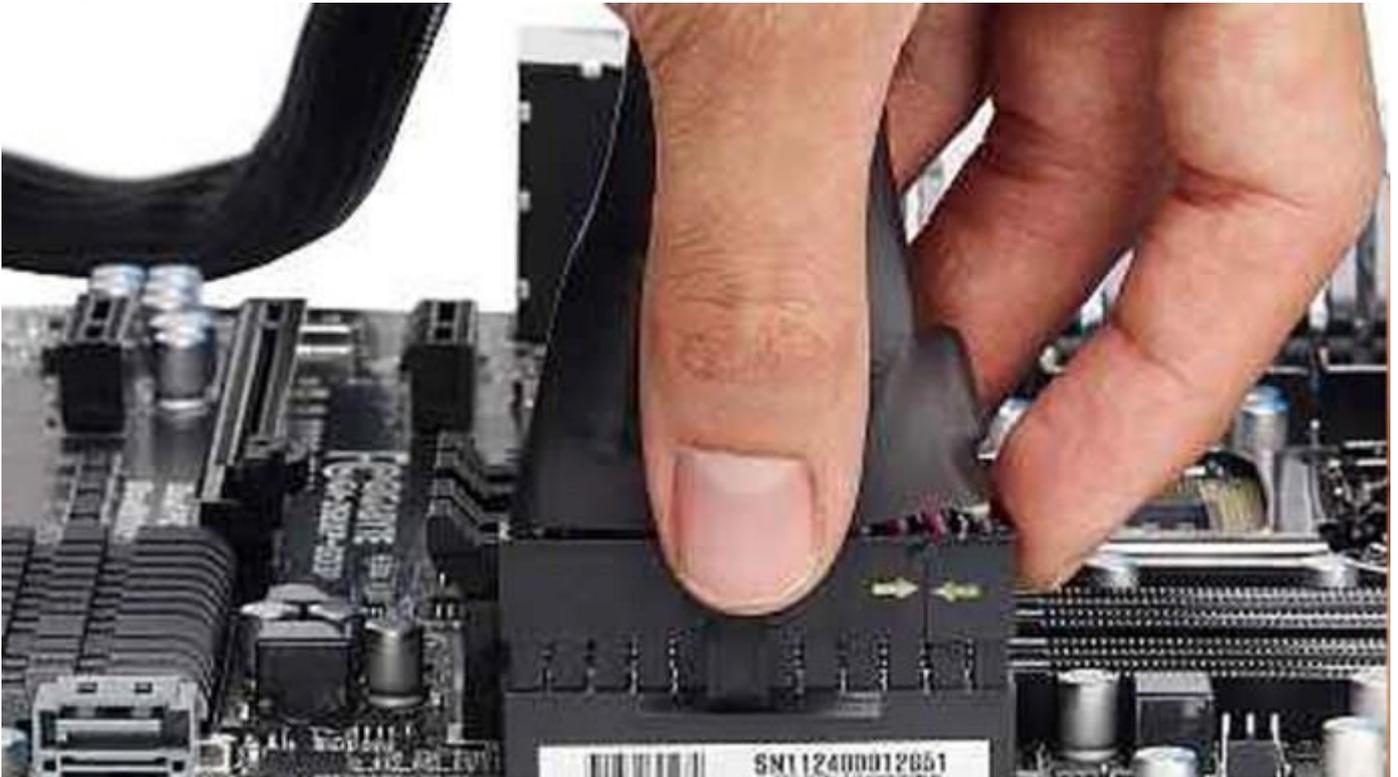
Type of SATA Cable	Definition	Uses & Applications
e-SATA	Cable available in lengths ranging from 0.5-2m	External connection to PCs
Low Profile SATA	Ultra-thin SATA cables with low profile connectors	Graphics cards
Micro SATA	SATA data cable	Internal drives and backplane applications
SATA Bracket	Dual-port e-SATA expansion brackets	Compatibility between computer outputs and e-SATA drives
SATA Bridge	SATA interface acting as a bridge between devices	Connecting ATA devices to SATA motherboards or PCI cards
SATA Power	SATA interface power cable	Connecting power adaptors, extensions and splitters for SATA power and data cables
SATA-SATA	Standard SATA cables available in a variety of lengths	Standard SATA applications

Serial Advanced Technology Attachment (SATA) cable is the next components to build PC. It is used to connect devices, including Hard Drives, Optical Drives, and SSD. There are two kind of cable are used for PC assembly, PATA and SATA. PATA or Parallel Advanced Technology Attachment, are the previous one, but because it slower than SATA, this cable is rarely used nowadays.



PCIe slots are slots commonly exist at motherboard, that comes in different sizes x1, x4, x8, x16 and different generations as well. The number after the x mean how many lanes (data travels to and from the PCIe card) that PCIe slot has. A PCIe x1 slot has one lane and can move data at one bit per cycle, and so on. It is used to attach things to the motherboard for example ssd drive or graphics card.

## Plug in the ATX connector



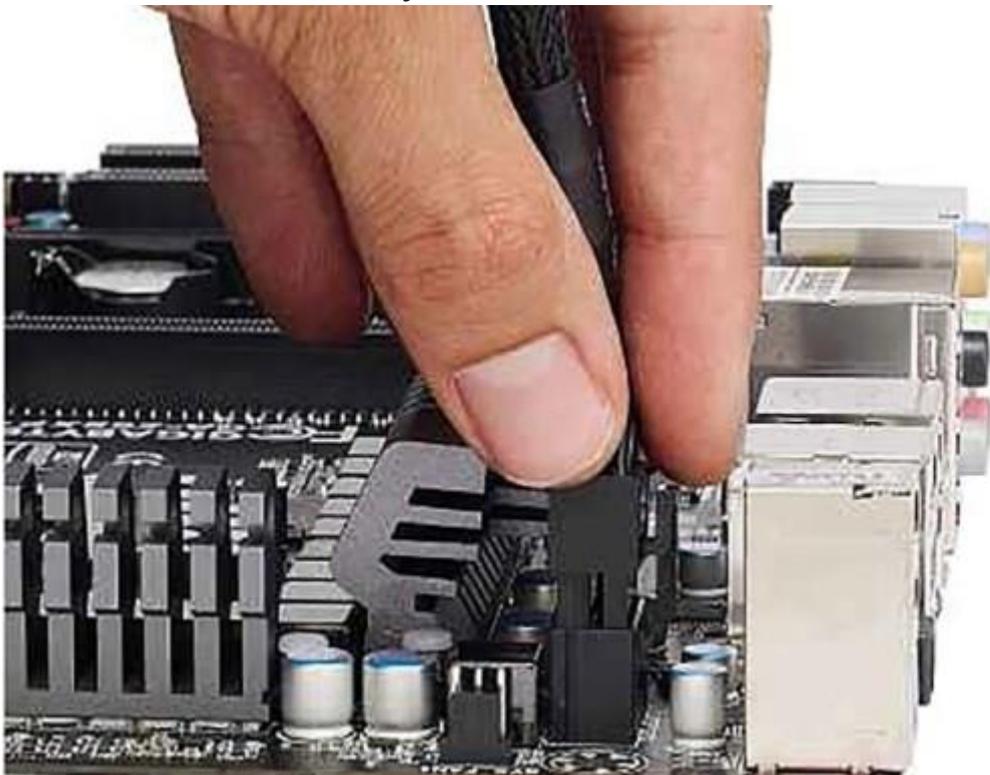
You wish to plug this 24-pin connector into the coordinating connector on the motherboard. This ought to be simple to discover, but it is ordinarily found by the IDE ports on the right-hand side of the motherboard. The ATX connector will as it was plug in one way, so you cannot get it off-base. Once it is lined up, the connector ought to plugin easily. There is a clip on it to hold it in place. This will require a delicate weight to induce it to clip in, but no more. On the off chance that you're having to drive the cable, at that point the chances are that you've got the connector the off-base way circular. Once the cable is input, deliver it a delicate pull to create beyond any doubt that it's secure.

## Identify secondary connector



Cutting edge motherboards too have an auxiliary control connector. On most sheets, usually a single four-pin connector, but a few require eight-pin connectors. Check to see what your power supply has, as you will have to be purchased an adaptor. In a comparative way to the 24-pin connector, the eight-pin connector on control supplies can be part into two. In case your motherboard has as it were a four-pin connector, you will need to part it into two parts. As it were one of these will plug into the motherboard.

## Connect secondary connector



Find the auxiliary motherboard control connector. Your board's manual will tell you precisely where it's found, but on most motherboards, it's close to the processor attachment. Following, plug the control supply's auxiliary connector into it. This plug will as it was go in one way, so there's no chance of getting it wrong. The connector ought to slide tenderly into the plug. You will get to apply a bit of constrain in arrange to induce the clip to bolt into put, and you ought to listen it tap when it's inappropriately.

## Installing PC step by step

### PART B

#### 1.0 Screwdrivers



Name: Screwdrivers

Function: Used to tighten and loosen screws.

Importance: Important to tighten screws of the PC

Additional Tips: Screwdriver with a magnetic tip will be more useful but it's not necessary. Also the longer the screwdriver the better

## 2.0 Zip Ties



Name: Zip Ties

Function: Used to hold wires together.

Importance: will be used to hold wires together in the PC which makes the whole PC setup much cleaner and organized while making the wires less likely to get damaged.

## 3.0 Snip Side Cutter



Name: Snip Side Cutter

Function: Used to cut things

Importance: Important to cut excessive plastic when holding wires together using zip ties.

#### 4.0 Magnetic Screw Holder

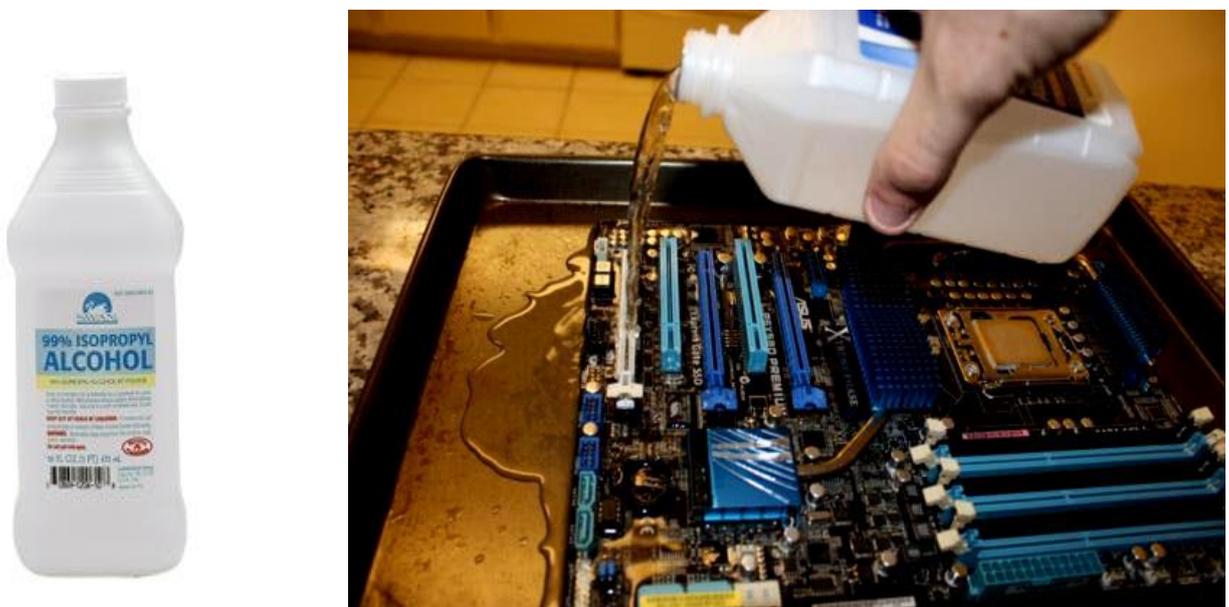


Name: Magnetic Screw Holder

Function: Used to keep the screws in safe place.

Importance: Important to avoid losing the screws and the magnet makes it easier.

#### 5.0 Alcohol





Name: Micro Fibber Cloth

Function: Clean dust from hard surfaces

Importance: Clean different PC components and the motherboard before assembling the PC

## 8.0 Flashlight



Name: Flashlight

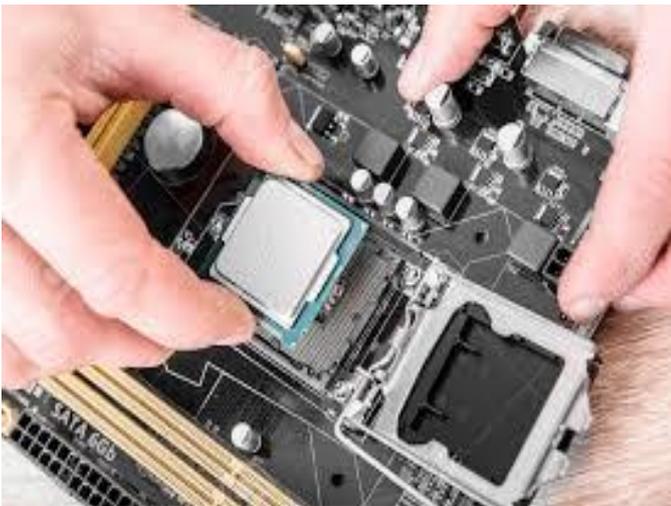
Function: Provide Light in Dark Spaces

Importance: To be able to see the tight places that are usually dark in the case

## Part C Step-By-Step Assembly

### Installing Processor (CPU)

Whether you're going with an Intel or an AMD construct, the primary step is to discharge the tension lever on the CPU so simply can drop the processor into the CPU socket. We know that the CPU is the brain of the computer. It is introduced on the motherboard within the socket. The bolt/triangle at the top of the CPU on the attachment cap ought to line up. Watch out not to point the bolt within the wrong course, something else the board or both will be harmed. Once the CPU and attachment are appropriately adjusted, you'll be able to take off the chip input, and it'll snap into the socket beneath its weight. On the off chance that it does not, at that point select the CPU and reinstall it. Once the CPU is properly installed into the attachment, press the pressure lever down (on Intel motherboards just like the one within the picture underneath ( Once the coolant is introduced, interface the fan connector to its head on the motherboard. This is often ordinarily someplace close to the CPU attachment and calls it something like CPU\_FAN.

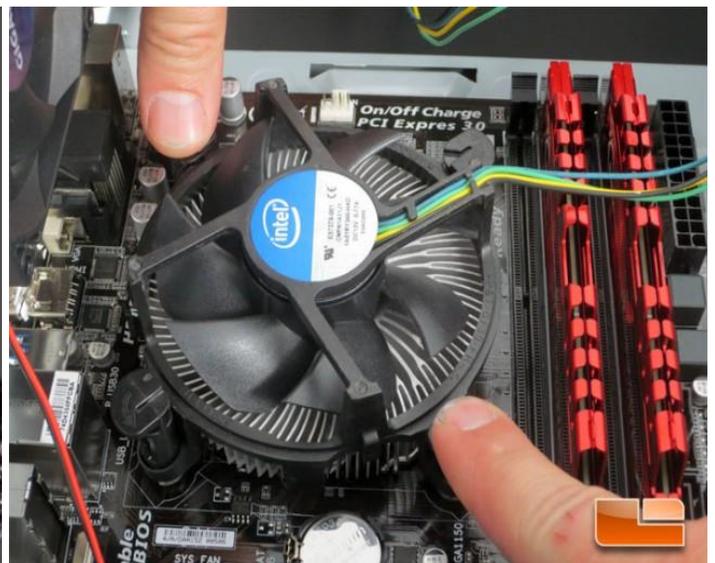


### The Cooler

Many processors come with coolers in the box. Although a lot of builders also like to purchase more powerful (and often quieter) aftermarket coolers, which may also be more attractive.

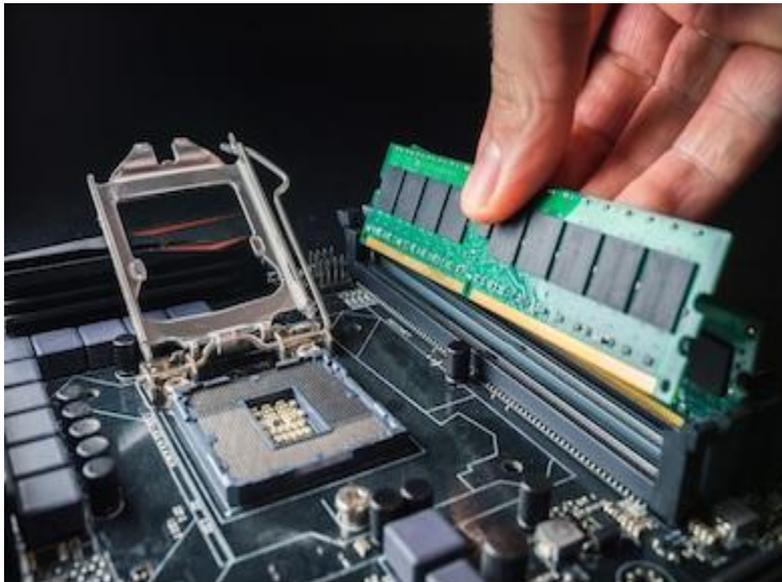
If you decide to use a stock cooler, you will find that it already has a thermal paste applied. With aftermarket coolers, you will generally need to apply your own thermal paste. You do not need a lot - just an amount of as small as beans applied to the center of the CPU will spread out when you apply the cooler.

<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQy-TPIEwV4203ICxd2rveuG2j1ZBjMRU9JA&usqp=CAU>



Intel processors' stock coolers use push pins that run through holes in the motherboard. We recommend pushing the opposite corners in to spread the thermal paste evenly, and to avoid uneven stress on one side of the CPU. AMD stock coolers have metal levers that stick notches on a plastic holder on either side of the socket. Aftermarket coolers are installed in different ways, so be sure to refer to the instruction manual, as installing aftermarket coolers can be surprisingly complicated and often includes a large back panel that must be installed behind the motherboard.

### Installing Memory (RAM)

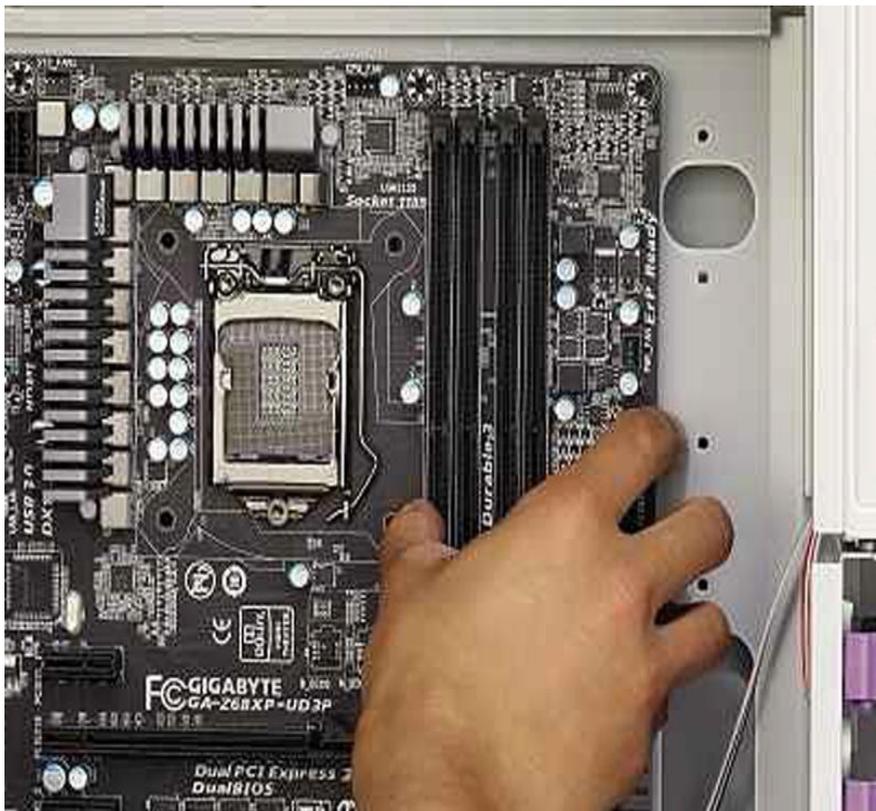


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Installing RAM, first make sure that each memory slot is unlocked. Some boards have a latch on the front and some on the side, once the latches are opened, look at each DIMM and place it over the slot so that the small hole under the RAM stick is aligned with the corresponding protrusion on the board. Finally, press the DIMM on each edge until it snaps into place, causing the latches to close on their own. The process requires a little force but be careful to place the piece in the wrong place.

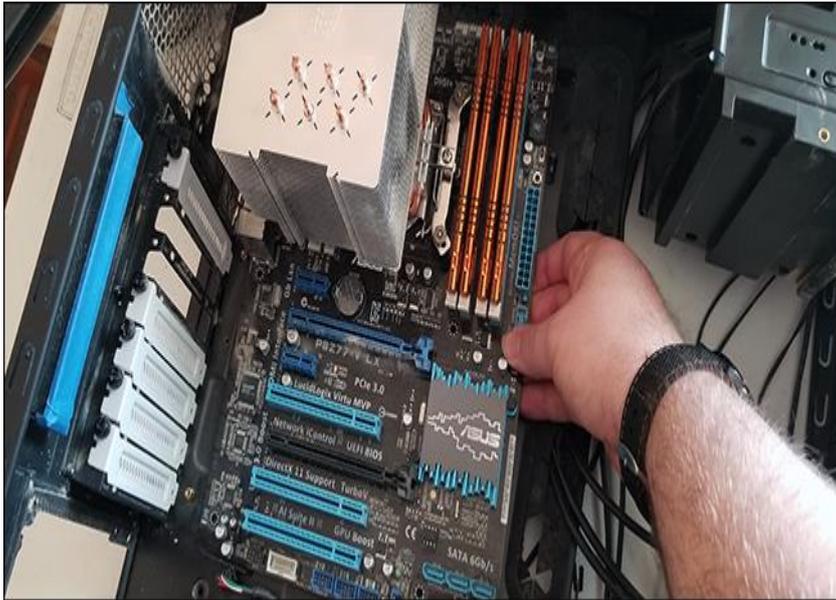
If you are installing two RAM modules in a four-slot board, check the motherboard manual to make sure the DIMMs are installed in the correct slots. If you put it in the wrong slots, it may not get the best possible performance, or the motherboard / OS may not recognize one of the sticks.

### Putting the Motherboard in the Case



Now that we have built the primary system, we will install the CPU and motherboard equipped with RAM in the box. Remove the side panels to install them. If you do not or are able to do so, do not worry there are some screws that you remove will be able to unscrew the side panel easily

The I/O shield, which covers the area around the rear ports, comes with the motherboard. You will need to mount the shield into the chassis before installing the motherboard itself, making sure it is on the right side up so that the



motherboard ports fit the slots once both are installed. You will have to use some force to hold the four corners in place. Be careful of the sharp edges to not cut yourself as well as metal parts that can block the vents - especially if you have an economical motherboard.

The exceptions are some premium panels, which ship with this pre-included shield, but you won't find that on most panels.

Now, it is time to put the motherboard in. Make sure the holes on the motherboard line up with the standoffs you installed and that the ports line up with the cutouts on the I / O shield. Once the board is in, put the screws into the standoffs to anchor the motherboard in place.

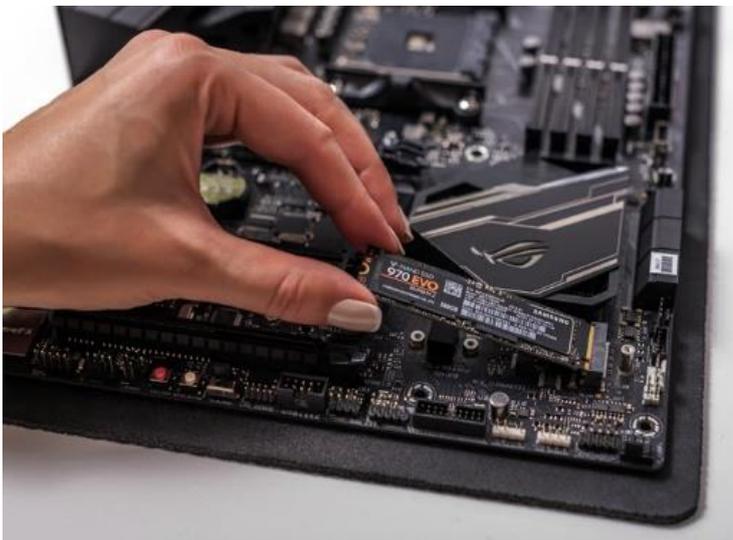
## Adding the Storage Device



The storage device can be of different type for example SSD or HDD for HDD it is usually connected by a cable and for SSD it is usually connected on the motherboard directly.

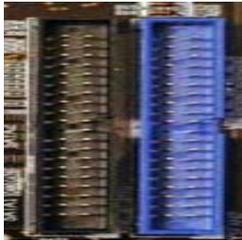
The SSD drive socket looks like this

And the SSD is installed like this by attaching the SSD to the socket



After installing the SSD there is a hole in the back of the SSD and there is a hole in the motherboard to add a screw so that the SSD become stable and don't move or get out of the socket.

This is the SSD with the screw.



For the HDD  
You start by placing the HDD in the specified place



After that you start adding the screws to hold the device in place.

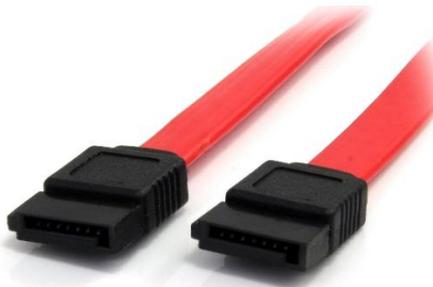


Then you connect the HDD with the motherboard using an IDE ribbon cable or SATA cable depending on the type of your HDD. This is what IDE ribbon cable looks like.

You connect one end to the HDD and the other to the motherboard. The end with pointy metals is called the male end and the other one is called the female end. The male end is attached to the HDD and the female end is attached to the motherboard.

This is what the socket looks like on the motherboard

For SATA cable this is what the cable looks like



Both ends are the same. You attach one end to the motherboard and the other one to the HDD

This is what the socket looks like in the motherboard.



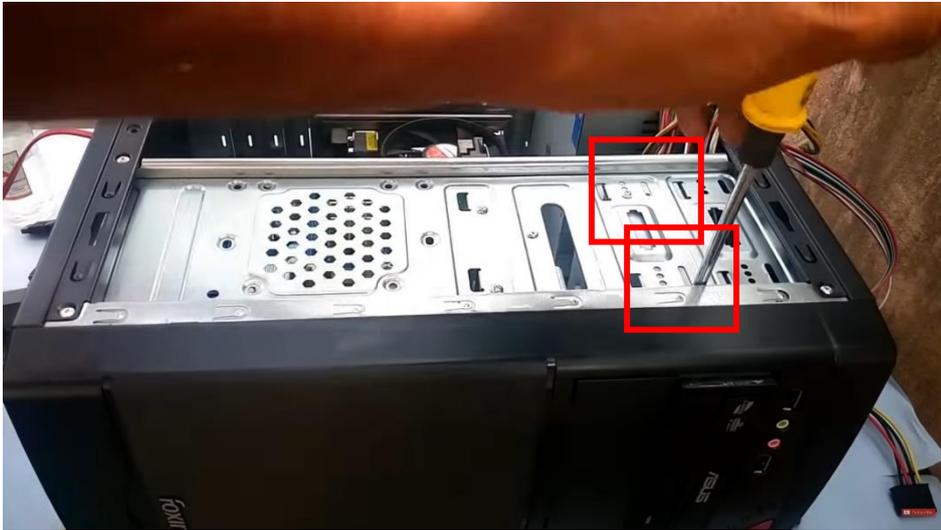
## 6.0 Adding the CD ROM (optional)

CD ROMs are not necessary in every PC but you can install a CD ROM

First of all you start adding the CD ROM to the case by pushing it from the outside like this



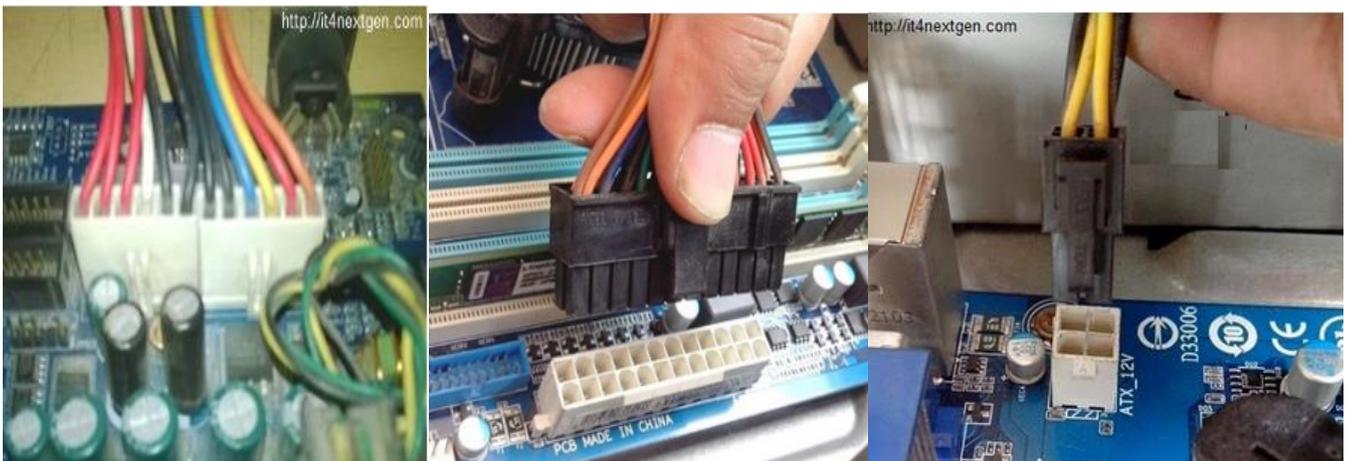
And as you did with the HDD you make the CD ROM stable by adding screws



Then you connect the CD ROM. CD ROMs can be SATA or IDE for IDE you connect the cable to the motherboard using SMPS 12 pin connector or ATX 24 pin connector or ATX 4 pin connector.

SMPS 12pin:

When connecting make sure that the black cables in on the inside.



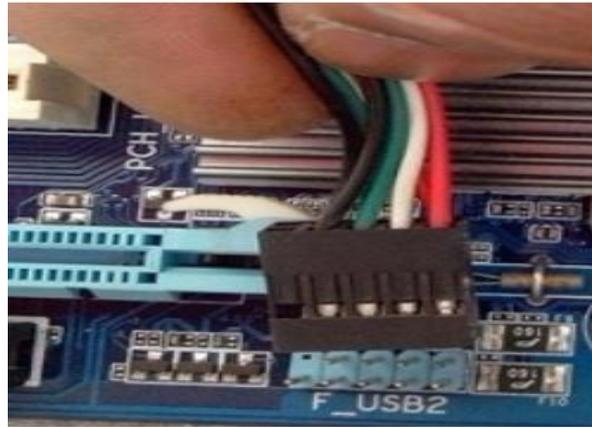
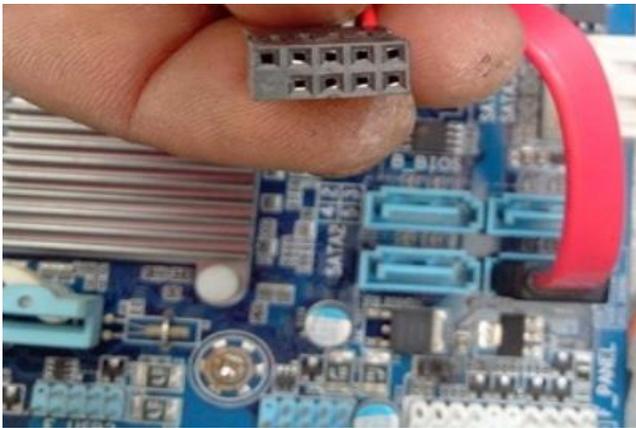
ATX 24pin:

For SATA CD ROMs the installing method is the same as for HDD.

### Attaching the cabinet connectors

Before closing the case you have to attach the cabinet connectors. Those are the power and reset button, HDD and power indicators, audio and USB ports, etc...

When installing you can read on the motherboard the no and socket purpose this for example is the F\_USB2.0 which is front USB port.



When you are done connecting all the cabinet connectors you are ready for the final step which is closing the case and testing.

### **Closing the case and testing**

After you are done attaching all the most components. Check for cables and hold all cables together utilizing zip ties and make beyond any doubt to cut the additional plastic from the zip ties. After you make beyond any doubt that there are no cables that are not organized, begin closing the case screwing all the screws input. At that point, you'll interface the PC to a screen, a console, and a mouse to begin testing the case.