

Computing Architecture

Personal Computer Build Research Project



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Introduction

With the development of science and technology, computers are becoming more and more popular in all our lives. According to every person's different identity and occupation, the configuration requirements of computer functions and performance are also different. Therefore, as the computing and Information Technology major student, it is especially important to learn how to build a computer and learn how to build a cost-effective computer. The main components of a computer are the monitor, the mainframe, and the peripheral equipment. Hence, in this project I will build an everyday desktop personal computer.

Component

1. Monitor

Response time that is the monitor's colour shift from black to white and back, so if the time is the shorter, the better, and I choose the response time is 1 ms. And refresh rates that is how many times of the monitor update with new information each second. Therefore, the bigger refresh rates are better for gaming, hence, this project is for everyday computer, I will choose 75Hz. There is another important factor which is the resolution of monitor, that higher is better, generally 1080p is enough.

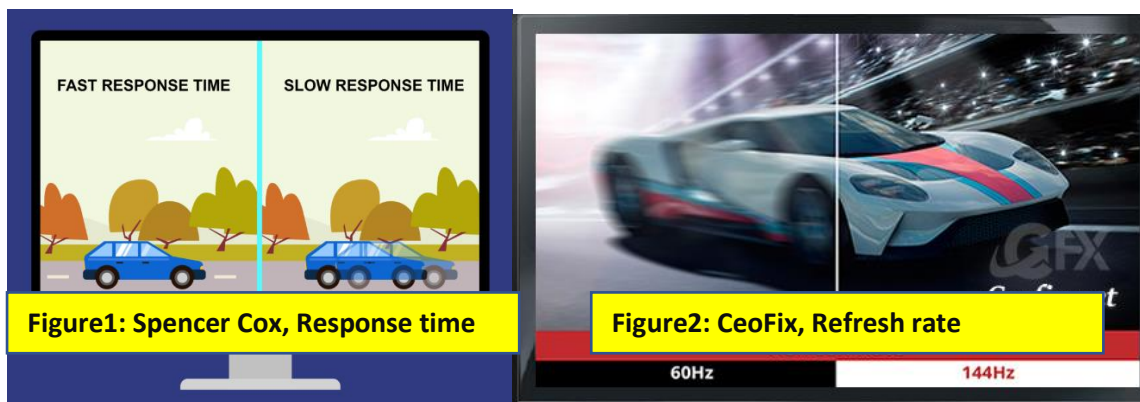


Figure3: Amazon.co.uk, ACER K272HLEbid Full HD 27" LED

Product features

- Full HD 1920 x 1080p
- Response time: 1 ms
- Input: HDMI / VGA / DVI
- Price: £149.99

Similar models in this range

Screen size: 27 "

2. Mainframe

1.Motherboard: As we know, there are two main brands of Motherboard which is Intel and AMD. But before choosing a motherboard, we must consider that is the compatibility of CPU and Motherboard. There are four types mother types motherboard, first one is X that also is the best (such as i7 7820X、i9 7900X 、i9 7920X、 etc.) And second is H that is for the beginner. (such as H310) There are two more which are Z and B, Z will be better than B. Because I will build an everyday computer, I choose type B motherboard which is MSI B360-A-PRO and match with i7-8700 CPU.



Figure4: Amazon.co.uk, MSI B360-A-PRO

MSI B360-A-PRO
• Price: £113.45

Intel Core i7-8700
• Price: £319.99



Figure5: Amazon.co.uk, Intel Core i7-8700

2.Ram: Base on the motherboard information, it shows that ram should be ddr4 and the speed should be 2666, 2400 or 2133. Same for Ram that bigger is better. And this motherboard has 4 ram slots, when we insert two chips of ram, it should follow order 1-3 or 2-4. But in this case, I just choose a chip 16GB and speed 2666 ram.



Figure6: Amazon.co.uk, RAM 16GB DDR4 2666

RAM 16GB DDR4 266

• Price: £43.98

3. Hard drive: compare with Hard Disk Drive (HDD) and Solid-State Drive (SSD), SSD will be faster than HDD. This motherboard accepts M.2 and SATA port, and the capacity which I will choose 1TB.



SanDisk SSD PLUS 1 TB SATA III 2.5 Inch Internal SSD, Up to 535 MB/s, Black

- Price: £84.99

Figure7: Amazon.co.uk, SSD SATA 1TB 535MB/s

4. Computer case: the motherboard is ATX type.



GOLDEN FIELD - Z3 Windowed Mid-Tower ATX/M-ATX/ITX PC Gaming Computer Case with Touch Panel for Desktop PC Computer

- Price: £56.98

Figure8: Amazon.co.uk, computer case, ATX

5. CPU cooler: basically, there are more heat pipes, that is better. Hence, I will choose 4 heat pipes.



DEEPCOOL GAMMAXX GT BK, CPU Air Cooler, SYNC RGB Fan and RGB Black Top Cover, Cable or Motherboard Control Supported, 4 Heat pipes, 120mm RGB Fan, Universal Socket Solution

- Price: £34.99

Figure9-10: Amazon.co.uk, CPU cooler

6. Power Supply: power source is ATX, therefore basically Wattage is 550w or 600w. We can choose bigger, because if wattage is smaller, it can't work properly. This one is 700w.



Black 700W ATX PC Power Supply
PSU with 120MM Quiet Fan And
PCI-E 6+2-Pin / 6 x SATA / 24-PIN /
8-PIN 12V / 3 x MOLEX / 1 x Floppy

- Price: £29.99

Figure11: Amazon.co.uk, Power supply 700W ATX PC

2. Peripheral equipment

1. keyboard: wireless



TECKNET 2.4G Wireless Keyboard
for Windows 10/8/7/Vista/XP and
Android Smart TV, Extra Long
Battery Life, UK keyboard Layout
and Whisper-Quiet Keyboard
Design

- Price: £14.99

Figure12: Amazon.co.uk, Wireless Keyboard

2. Mouse wireless:



[Updated Version] Wireless
Mouse, Patuoxun 2.4G USB
Wireless Mice Optical PC Laptop
Computer Cordless Mouse

- Price: £8.99

Figure13: Amazon.co.uk, Wireless Mouse

2. Headphone wireless:



Figure14: Amazon.co.uk, Wireless headphone

6S Wireless Headphones Over Ear, Hi-Fi Stereo Foldable Wireless Stereo Headsets Earbuds with Built-in Mic, Volume Control, FM for iPhone/Samsung/iPad/PC (Black & Gold)

- Price: £16.99

3. Webcam: USB



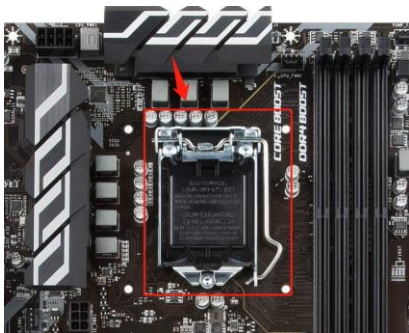
Figure15: Amazon.co.uk, USB Webcam

Teasiy USB Webcam with Microphone, 1080P HD

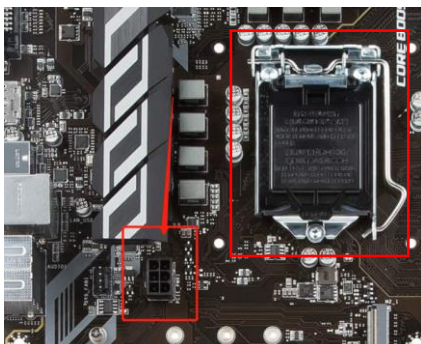
- Price: £17.98

Building

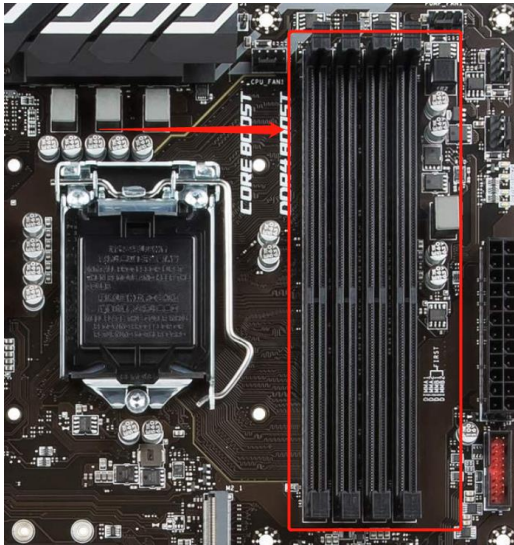
1. Insert CPU into the motherboard



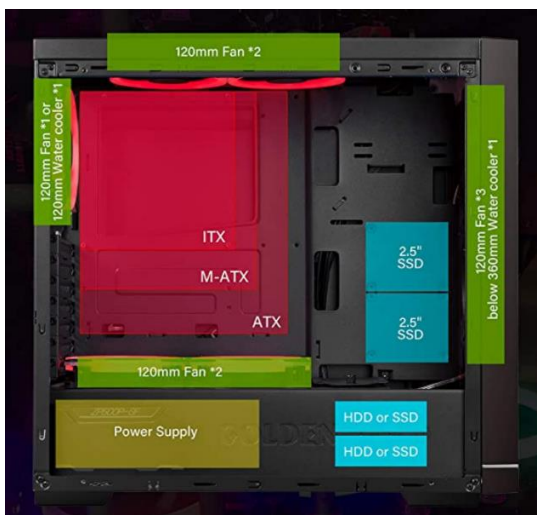
2. Attach the heat sink, and plug it



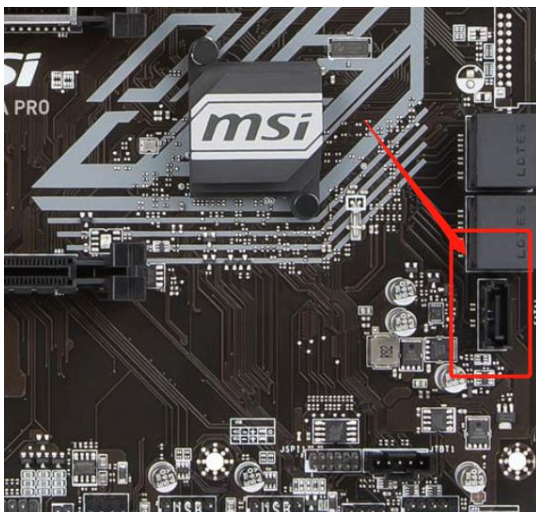
3. Insert Ram into the slots



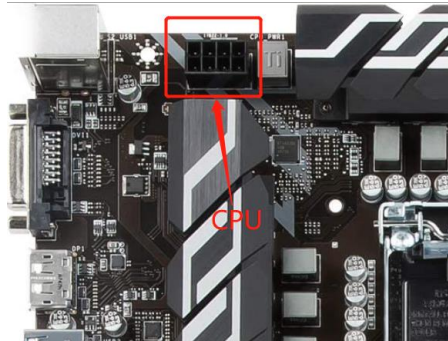
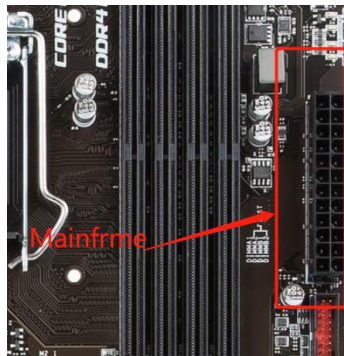
4. Screw the motherboard into the case, and put SSD and power supply into the case



5. Plug SSD into SATA port

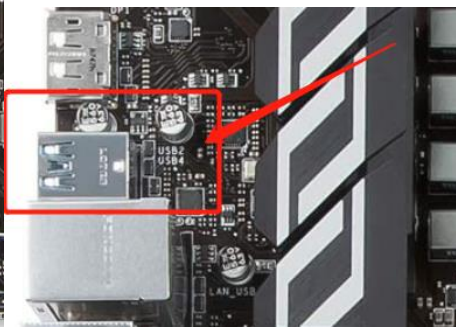
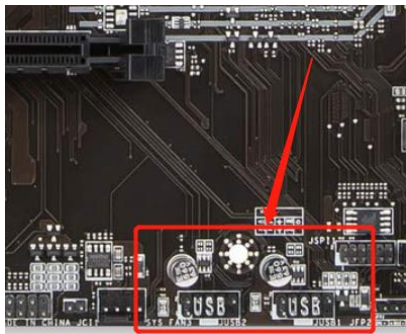


6. plug power supply into the motherboard

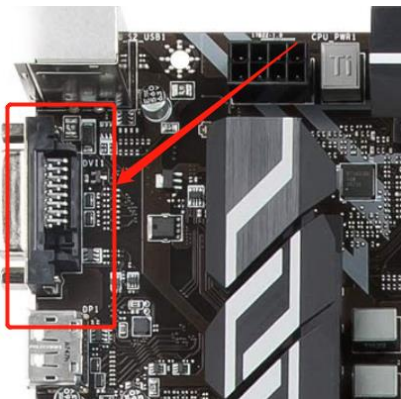


7. Close the case

8. Plug keyboard, mouse, and webcam into USB (front and back) port



9. Connect the screen into the motherboard



10. Install windows10 system



Figure16: Amazon.co.uk, Windows 10 Professional USB

Windows 10 Professional USB
| English | 1 PC | 32/64 Bit |
Flash Drive | Original Product
| Box | Windows 10 Pro USB

- Price: £99.00

- **Total: £992.31**
(about € 1083.11)

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Figure13: Amazon.co.uk, Wireless Mouse, [online] Available at: [\[Updated Version\] Wireless Mouse, Patuoxun 2.4G USB Wireless Mice Optical PC Laptop Computer Cordless Mouse with Nano Receiver, 6 Buttons, 2400 DPI 5 Adjustment Levels for Windows Mac Macbook Linux - Super Energy Saving, Black: Amazon.co.uk: Computers & Accessories](#) [Accessed 12.12.2020]

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