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S20	Computer Architecture and Operating System (DipIT05)	A1	Individual Report

## Technical Report

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## 1. Main Components of a computer

Some of the main components of a computer system are listed below:

- 1) Motherboard
- 2) Processor
- 3) RAM (Random Access Memory)
- 4) Power Supply
- 5) Cooling System
- 6) HDD (Hard Disk Drive) / SSD (Solid State Drive)

### 1.1. Motherboard

Motherboard, also referred to as the main circuit board, is a computer's main communication backbone connectivity hub that connects all the other components as well as external peripherals.

- ❖ It provides a crucial electronic connection between the hardware units to ensure the effective and efficient execution of tasks performed by the user.
  - ❖ It is responsible for distributing power to the different components of the computer.
- (Haughn, 2016)

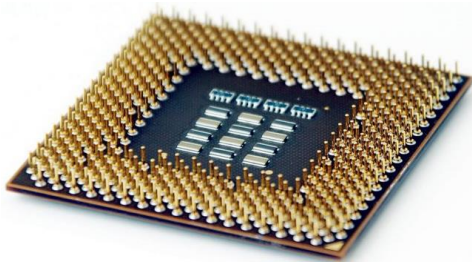


*Figure 1: Motherboard*  
(Pexels, 2014)

### 1.2. Processor

A processor is an integrated electronic circuit that performs the calculations that a computer is instructed to perform. A processor performs arithmetical, logical, input/output (I/O) and other basic instructions that are passed from an operating system (OS). The four primary functions of a processor are:

- ❖ Fetch: The processor fetches the address number from memory.
- ❖ Decode: The instructions are decoded into binary instructions, which the CPU can understand.
- ❖ Execute: During the execution of instructions, CPU can either do calculations with the ALU, move data from one memory location to another, or jump to a different address.
- ❖ Store: The instruction is stored somewhere on the CPU after execution. (Haughn, 2019)

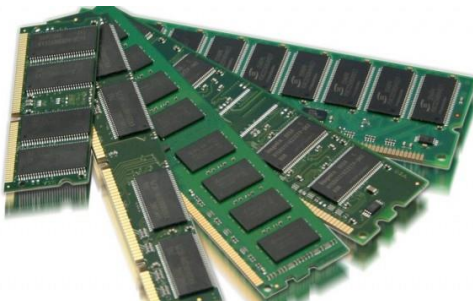


*Figure 2: Processor*  
(Anubias, 2019)

### 1.3. RAM (Random Access Memory)

RAM is a type of data storage device that stores the files being used while the computer is running. It is a temporary data storage system because when the machine is turned off, all files and data on it are lost.

- ❖ In contrast to other forms of data storage, RAM provides quicker access to files.
- ❖ RAM stores data that computer programs actively use and need not be permanently stored. (Tanner, 2020)



*Figure 3: RAM*  
(Hruska, 2019)

## 1.4. Hard Disk Drive (HDD) / Solid State Drive (SSD)

The computer's HDD or SSD is a non-volatile hardware device that holds all the software and all the data files that the software generates. It includes all records that have been created and downloaded.

- ❖ It stores data and information permanently and can be retrieved anytime.
- ❖ A large amount of data can be stored and it is also a portable means to store the information. (Wilson, 2019)



Figure 4: HDD and SSD  
(Fulfilled Interest, 2019)

## 1.5. Cooling System

The cooling system is essential in a computer system as a large amount of heat is generated inside a computer by different hardware components such as CPU, video card, hard drive, etc.

- ❖ It maintains optimal operating temperature in the computer system.
- ❖ It uses different methods like heat sinks and fans to achieve the necessary optimal operating temperature. (Beal, 2020)



Figure 5: Heat Sink  
(IndiaMART, 2020)

## 1.6. Power Supply Unit

Power Supply Unit is a hardware component that regulates the overheating of a computer and supplies power to all other components.

- ❖ It provides electrical current power to different components of the computer system.
- ❖ It converts AC to DC voltage to supply it to motherboard, adapters, and peripheral devices. (Schmidt, 2013)



*Figure 6: Power Supply Unit*  
(wisegeek, 2020)



## 2. Different types of processors

The differences between Intel Core i3, i5 and i7 processor is tabulated below:

<i>Core i3</i>	<i>Core i5</i>	<i>Core i7</i>
It is an Entry-level processor.	It is a mid-range processor.	It is a high-end processor.
It consists of 2 cores.	It consists of 2-4 cores.	It mostly consists of 4 cores.
It has the power consumption rating at 73 watts.	It has the power consumption rating at 95 watts.	It has the highest power consumption rating at 130 watts.
Its core speed range is 1.2 GHz to 3.33 GHz.	Its core speed range is 1.06 GHz to 3.6 GHz.	Its core speed range is 1.06 GHz to 3.46 GHz.
It typically has between 3 to 4 MB of cache.	It has between 3 to 6 MB of cache.	It has between 4 to 8 MB of cache.
It has low range graphics.	It has mid-range graphics.	It has top-range graphics.

Table 1: Differences between Intel Core i3, i5 and i7 processors.

(Patkar, 2018) (Josiah, 2017)

### 3. Different types of RAM

There are mainly two types of RAM, i.e. Static Read Only Memory (SRAM) and Dynamic Read Only Memory (DRAM). The differences between them is tabulated below:

<i>STATIC RANDOM-ACCESS MEMORY (SRAM)</i>	<i>DYNAMIC RANDOM-ACCESS MEMORY (DRAM)</i>
It stores data or programs as long as power supply is on.	It loses the stored information in a very short time even though power supply is on.
It is made up of transistors and flip flop.	It is made up of capacitors and few transistors.
Refreshing circuit is not implemented in it.	Refreshing circuit is implemented in it.
It is faster than DRAM.	It is slower than SRAM.
It may be located in the CPU or between the central memory and the CPU of a computer.	It is located on the motherboard.
It has low density.	It has high density.
It has low power consumption rate.	It has high power consumption rate.
It does not require periodic refreshing.	It requires periodic refreshing.

Table 2: Differences between Static RAM and Dynamic RAM  
(GeeksForGeeks, 2020)

## 4. Different types of ROM

There are mainly three types of ROM, i.e. Programmable Read Only Memory (PROM), Erasable Programmable Read Only Memory (EPROM) and Electronically Erasable Programmable Read Only Memory (EEPROM). The differences between them is tabulated below:

<i>PROM</i>	<i>EPROM</i>	<i>EEPROM</i>
It stands for Programmable Read Only Memory.	It stands for Erasable Programmable Read Only Memory.	It stands for Electronically Erasable Programmable Read Only Memory.
It was developed by Wen Tsing Chow in 1956.	It was developed by Dov Frohman in 1971.	It was developed by George Perlegos in 1978.
It can be programmed only once.	It can be erased by UV rays and then be programmed again.	It can be Electrically erased and then be reprogrammed.
Bipolar transistor is used in it.	Metal Oxide semiconductor Transistor is used in it.	Metal Oxide Semiconductor Transistor is used in it.
It is inexpensive.	It is costlier than PROM.	It is more expensive than both PROM and EPROM.
It offers less flexibility since instructions are only written only once.	It offers more flexibility as instructions are erasable.	It is the most flexible as instructions are electronically erasable.
Its example is: CD-R.	Its example is: CD(RW).	Its example is: Pen drive.

Table 3: Differences between PROM, EPROM and EEPROM  
(GeeksForGeeks, 2020)

## 5. Different types of memory systems

The differences between Virtual memory, Associative memory and Cache memory is tabulated below:

<i>Virtual memory</i>	<i>Associative memory</i>	<i>Cache memory</i>
Virtual memory is a memory management feature that uses hardware and software to allow a device to account for physical memory limitations by moving data from random access memory (RAM) to disk storage for a temporary time.	Associative memory is a type of computer memory from which items may be retrieved by matching some part of their content and is accessed simultaneously and in parallel on the basis of data content rather than by specific address or location.	Cache memory is a small-sized type of volatile computer memory that provides a processor with a high-speed access to data and stores commonly and frequently used computer programs, applications and data.
It is managed by the hardware.	It is managed by the operating system.	It is managed by the hardware.
It is slower than cache but faster than associative memory.	It is slower than virtual as well as cache memory.	It is the faster memory than virtual and associative memory.
It stores the programs which are not getting accommodated in main memory.	Associative memory is Content Addressable Memory.	It stores frequently used data.

Table 4: Differences between Virtual, Associative and Cache memory  
(Lithmee, 2018)

## 6. Different types of Hard-drive controllers

There are two types of Hard-drive controllers i.e. Serial Advanced Technology Attachment (SATA) and Parallel Advanced Technology Attachment (PATA). The differences between them is tabulated below:

<b>SERIAL ADVANCED TECHNOLOGY ATTACHMENT (SATA)</b>	<b>PARALLEL ADVANCED TECHNOLOGY ATTACHMENT (PATA)</b>
SATA is a new standard for connecting hard drives into computer systems based on serial signaling technology and is currently in use.	PATA is an outdated standard for connecting hard drives into computer systems based on parallel signaling technology.
Due to the reason of SATA cables being smaller in size, it allows increased airflow inside the case of a computer allowing the improvement of overall life of a computer.	Since PATA cables are larger, it affects the airflow inside the case of a computer reducing the overall life of a computer.
It supports hot swapping.	It does not support hot swapping.
Its cable size is smaller than PATA.	Its cable size is larger than SATA.
SATA cables are faster because it can provide up to 600MB/s data rate.	PATA cables can only provide maximum up to 133MB/s.

Table 5: Difference between SATA and PATA  
(Computer Hope, 2018)

## 7. Different types of internal power connectors

The differences between EPS, ATX and Molex cable is tabulated below:

<b><i>EPS</i></b>	<b><i>ATX</i></b>	<b><i>Molex</i></b>
It provides power to the CPU as motherboard pins are not enough to provide power to the CPU.	It provides power to the motherboard through the Power Supply Unit (PSU).	It provides power to hardware peripherals like Hard drives, CD-ROM players, powering case fans etc.
It has 8 pins and the usage of 4 pins is optional which exist to ensure that enough power can be provided to the CPU for overclocking.	It has 24 pins and is backwards compatible with a 20-pins motherboard.	It has 4 pins and also an angular side.
It can be spilt into two 4-pin connectors.	It can be spilt into 20 pins and 4 pins.	It cannot be spilt.
It is easy to detach.	It is easy to detach.	It can be extremely difficult to detach.

Table 6: Differences between EPS, ATX and Molex  
(Kooter, 2016)

## 8. Drafting a budget for a cheap and a top range PC

S/N	Name of component	Cost for Cheap range (NPR)	Cost for Top Range (NPR)
1.	Processor	Rs. 8,000	Rs. 20,000
2.	Motherboard	Rs. 10,000	Rs. 40,000
3.	Random Access Memory (RAM)	Rs. 1,500	Rs. 4,000
4.	Graphical Processing Unit (GPU)	Rs. 20,000	Rs. 45,000
5.	Storage	Rs. 2,000	Rs. 10,500
6.	Power Supply	Rs. 1,000	Rs. 5,500
7.	System Cooling	Rs. 1,000	Rs. 3,000
8.	Case	Rs. 2,000	Rs. 5,000
9.	Monitor	Rs. 6,000	Rs. 20,000
10.	Keyboard	Rs. 1,000	Rs. 3,000
11.	Mouse	Rs. 300	Rs. 1,500
	Total	Rs. 52,800	Rs. 1,57,500

Table 7: Drafting a budget for a cheap and a top range PC

## 9. Budgeting and Planning for PC

### 9.1. Cheap range PC

#### i) Processor

- **Name:** Intel Core I5- 9400f 9th Gen Processor
- **Description:**
  - 6 Cores/ 6 Threads
  - 2.90 GHz up to 4.10 GHz Max Turbo Frequency
  - 9 MB Cache
  - Bus Speed: 8 GT/s DMI3
  - Max memory Size: 128GB
  - Lithography: 14 nm
- **Cost:** Rs. 20,499  
(Intel, 2020) (HamroBazar, 2020)



Figure 7: Intel Core I5-9400f  
(Alcorn, 2019)

#### ii) Motherboard

- **Name:** Esonic H61 Motherboard
- **Description:**

##### Key Specifications:

- Supports Intel core i3 i5 i7 CPU
- Supports DDR3 1600/ 1333/1066 memory, Support up to 8GB
- Intel® Graphics Media Accelerator X4500 HD
- 1 VGA port
- Expansion Slots 1
- PCI Express X16 slot 1

##### I/O Connectors

- IDE connector
- 4 SATA 3Gb/s connector
- 1 panel connector (front)
- 1 audio connector (front)
- 4 USB 2.0 connector
- 4 USB 2.0 port
- 7. 1 PS/2 port



Figure 8: Esonic H61 Motherboard  
(HamroBazaar, 2020)



- 8. 1 VGA port
- 1 RJ-45 port
- 1 LPT port
- 1 HDMI port
- 1 audio jacks

Price: Rs.4,799

(HamroBazaar, 2020)

### iii) RAM

- **Name:** Hynix DDR3 4GB RAM
- **Description:**
  - Memory Storage Capacity: 4 GB
  - RAM Size: DDR3
  - Specified Voltage: 1.5 v



Figure 9: Hynix DDR3 RAM

(Amazon, 2020)

- **Cost:** Rs. 1,999  
(Daraz, 2020)

### iv) GPU

- **Name:** MSI Gaming GeForce GT 710
- **Description:**
  - Chipset: NVIDIA GeForce GT 710
  - Maximum Displays: 2
  - Video Memory: 2GB DDR3
  - Memory Clock: 1600 MHz
  - Memory Interface: 64 bits
  - Connectors: VGA, DVI D Dual Link, HDMI



Figure 10: MSI Gaming GeForce GT 710

- **Cost:** Rs. 7,000  
(PasalNepal, 2020)

(Amazon, 2020)

## v) HDD

- **Name:** Seagate BarraCuda 2TB SATA HDD
- **Description:**
  - 2TB storage capacity 7200 RPM
  - 256 MB Cache
  - 6Gb/s NCQ Interface
  - 3.5" Hard Disk Bare Drive
- **Cost:** Rs. 9,800  
(BigByte, 2020)



Figure 11: Seagate 2TB SATA HDD

(BigByte, 2020)

## vi) Power Supply

- **Name:** Elite Power 350W Power Supply
- **Description:**
  - Multi-protection design (OVP/OCP/OPP/SCP)
  - Supports dual +12V1 and +12V2 outputs for high power usage
  - One 4+4 pin +12V CPU connector for high-end CPU
  - EMI Noise filter built-in design
  - Gives over 70% efficiency during typical loading
  - Compliance with the latest Intel standard ATX 12V V2.3
- **Cost:** Rs. 5,250  
(PasaINepal, 2020)



Figure 12: Elite Power 350W Power Supply

(PasaINepal, 2020)

## vii) System Cooling

- **Name:** xDream i117 CPU Air Cooler
- **Description:**
  - CPU support: Core™ i7, core™ i5, core™ i3, Pentium, Celeron
  - Dimensions (l x w x h): 112.2 x 112.2 x 60.4 mm
  - Weight: 370.2 g
  - Heat sink material: Aluminum
  - Fan dimensions (l x w x h): 95 x 95 x 20 mm
  - Fan life time expectancy: 40,000 hours
  - Connector: 3-pin
  - Rated voltage: 12 vdc
  - Fan rated current: 0.18a
  - Fan power consumption: 2.16w



Figure 13: xDream i117  
CPU Air Cooler

- **Cost:** Rs. 1,563

(PasaNepal, 2020)

(PasaNepal, 2020) (CoolerMaster, 2020)

## viii) CPU Case

- **Name:** Cooler Master Elite 311 Cabinet CPU Case
- **Description:**
  - Type: Mid Tower
  - Material: Steel body, mesh front bezel, ABS Plastic
  - Front Ports: USB
  - Expansion Slots: 7
  - Maximum compatibility – CPU: 160mm / 6.3 inch
  - Feature: Portable
- **Cost:** Rs. 7,000

(Thulo, 2020)



Figure 14: Cooler Master Elite  
311 Cabinet CPU Case

(Thulo, 2020)

## ix) Monitor

- **Name:** Dell S2216H
- **Description:**
  - 22" In-Plane Switching (IPS) Monitor
  - Panel Type: IPS LED-backlit LCD monitor
  - Response Time: 6 ms (gray-to-gray)
  - Contrast Ratio 1000:1 / 8000000:1 (dynamic)
  - Aspect Ratio Widescreen - 16:9
  - Input Connectors HDMI, VGA



Figure 15: Dell 22" Monitor  
(Bigbyte, 2020)

- **Cost:** Rs. 21,800

(Bigbyte, 2020)

## x) Keyboard

- **Name:** L-100 SK-8115 (DJ331) Strong Wired Thin USB Keyboard
- **Description:**
  - Item Model number: SK-8115
  - Interface type: USB interface supports hot-pluggable.
  - Transmission mode: cable
  - Press the pattern: 104 keys standard keypad layout
  - Item Height: 45.7cm
  - Item Width: 5.1cm
  - Item Weight: 1.36 Kg
  - Package Dimension: 18.2 x 6.6 x 1.4 inches
  - Localization: US/English Layout
  - Color: Black
  - Keyboard connection: Wired
  - Keyboard packaging: boxed



Figure 16: SK-8115 Wired Keyboard  
(Daraz, 2020)

- **Cost:** Rs. 840

(Daraz, 2020)

**xi) Mouse**

- **Name:** Fantech T530 Wired Mouse
- **Description:**
  - Brand: Fantech
  - Mouse Type: Optical Mouse
  - Model: T530
  - Connectivity: Wired
- **Cost:** Rs. 399  
(Daraz, 2020)



Figure 17: Fantech T530  
Wired Mouse  
(Daraz, 2020)

### Summarizing the budgeting and planning for a cheap range PC

S/N	Name of component	Description	Cost (NPR)	References
1.	Processor	Intel Core I5- 9400f	Rs. 20,499	(HamroBazar, 2020)
2.	Motherboard	Esonic H61	Rs.4,799	(HamroBazaar, 2020)
3.	RAM	Hynix 4GB DDR3 RAM	Rs. 1,999	(Daraz, 2020)
4.	GPU	MSI Gaming GeForce GT 710	Rs. 7,000	(PasalNepal, 2020)
5.	Storage (HDD)	Seagate BarraCuda 2TB SATA HDD	Rs. 9,800	(BigByte, 2020)
6.	Power Supply	Elite Power 350W Power Supply	Rs. 5,250	(PasalNepal, 2020)
7.	System Cooling	xDream i117 CPU Air Cooler	Rs. 1,563	(PasalNepal, 2020)
8.	Case	Cooler Master Elite 311 Cabinet	Rs. 7,000	(Thulo, 2020)
9.	Monitor	Dell S2216H 22" IPS Monitor	Rs.21,800	(Bigbyte, 2020)
10.	Keyboard	SK-8115 Wired USB Keyboard with 104 Keys	Rs. 840	(Daraz, 2020)
11.	Mouse	Fantech T530 Wired Mouse	Rs. 399	(Daraz, 2020)
	Total amount		Rs. 80,949	

Table 8: Budgeting and Planning for a cheap range PC

**Note: The total price of item does not contain delivery charges.**

## 9.2. Top range PC

### i) Processor

➤ **Name:** Intel Core i7 9700K 9th Gen Processor

➤ **Description:**

- 8 Cores / 8 Threads
- 3.60 GHz up to 4.90 GHz Turbo Frequency
- 12 MB Cache
- Bus Speed: 8 GT / s
- Max memory Size: 128GB
- Lithography: 14 nm
- Processor Graphics: Intel® UHD Graphics 630



Figure 18: Intel Core i7 9700K 9th gen processor

(TechPowerUp, 2018)

➤ **Cost:** Rs. 57,800

(BigByte, 2020) (Intel, 2020)

### ii) Motherboard

➤ **Name:** MEG Z390 Ace Motherboard

➤ **Description:**

- Supports 9th / 8th Gen Intel® Core™ / Pentium® Gold / Celeron® processors for LGA 1151 socket
- Supports DDR4 Memory, up to 4500(OC) MHz
- Mystic Light Infinity: 16.8 million colors / 29 effects can be controlled easily. Both RGB and RAINBOW LED strip is supported by Mystic Light Extension.
- Pre-installed I/O Shielding: Better EMI protection and more convenience for installation



Figure 19: MEG Z390 ACE motherboard

(MSI, 2020)



- 3x Turbo M.2 with Shield Frozr and Dual Front Gen2 Type-C USB 3.1 for fast game experience.
- Audio Boost HD
- Built-in M.2 thermal solution

➤ **Cost:** Rs. 53,150  
(Chand, 2020) (MSI, 2020)

### iii) RAM

➤ **Name:** G.SKILL TridentZ 3000Mhz 32GB (2x 16GB) RAM

➤ **Description:**

- Memory Storage Capacity: 32GB (2x 16GB)
- Memory Model F4-3000C16D-32GTZR
- RAM Size: DDR4
- Specified Voltage: 1.35 v
- CAS Latency: 16



Figure 20: G.SKILL TridentZ 3000Mhz 32GB RAM  
(ITECH Store, 2020)

➤ **Cost:** Rs. 30,999  
(ITECH Store, 2020)

### iv) GPU

➤ **Name:** iGame GeForce RTX 2060 SUPER Ultra 8GB OC

➤ **Description:**

- GPU: GeForce RTX 2060 SUPER OC
- Manufacturing Process: 12nm
- CUDA Cores: 2176
- Memory Size: 8GB
- Memory Type: GDDR6
- DirectX Shader Model: DirectX 12.1
- OpenGL 4.5
- Display Ports: 3\*DP+HDMI
- Power Connector: 8+8pin
- Cooling System Type: Air Cooling



Figure 21: iGame GeForce RTX 2060 SUPER Ultra 8GB OC GPU  
(BigByte, 2020)



- **Cost:** Rs. 62,800  
(BigByte, 2020)

**v) SSD**

- **Name:** Addlink 568 - 512 GB SSD
- **Description:**
  - Capacity: 512 GB
  - NAND Flash: 3D TLC
  - Dimensions: 80(L)x22(W)x3.58(Max.H), 8.2g
  - Interface: NVMe GEN3x4 1.3
  - Operating Temp: 0°C ~ 70°C
  - Storage Temp: -40°C ~ 85°C



Figure 22: Addlink 512 GB SSD  
(Bigbyte, 2020)

- **Cost:** 12,800  
(Bigbyte, 2020)

**vi) Power Supply**

- **Name:** Frontech 800w Power Supply
- **Description:**
  - Compliant with ATX 12V. 20/24 pin Main Power Connector.
  - Over-voltage, over-current, and short circuit protection
  - 120 mm Smart Cooling Fan
  - Supports Multi-Core CPU, Molex Connectors - 2 Pcs, SATA Connectors - 3 Pcs, 4 Pin ATX Connector- 1Pc, 6 (4+2) Pin PCI-E Connector - 1Pc
  - Supports power protection.



Figure 23: Frontech 800w Power Supply  
(KinbechNepal, 2020)

- **Cost:** Rs.3,200  
(KinbechNepal, 2020)

### vii) System Cooling

➤ **Name:** CPU Liquid Cooler (Seidon 120V PLUS)

➤ **Description:**

- Pump which is highly optimized and a water block.
- 120mm radiator for heat dissipation and fits internally and externally in most cases.
- 120mm JetFlo with a wide RPM range to fine tune and balance fan noise and performance.
- LED indicator lights up when it is operating.



Figure 24: Seidon CPU Liquid Cooler  
(PasalNepal, 2020)

➤ **Cost:** Rs. 10,095

(PasalNepal, 2020)

### viii) CPU Case

➤ **Name:** Cooler Master Case 5 CPU Case

➤ **Description:**

- Materials: SECC, plastic
- Dimensions (l x w x h): 512 x 235 x 548 mm, 460(l) x 235(w) x 460(h) mm
- Motherboard support: ATX, micro ATX, mini ITX
- Expansion slots: 7
- 5.25" drive bays: 2
- 3.5" drive bays: 2
- Drive bays 2.5 "
- SSD: (2+2)
- size: mid tower
- dust filters: bottom, front and top.

➤ **Cost:** Rs. 19,000

(Hamro Bazaar, 2020) (Cooler Master, 2020)



Figure 25: Cooler Master Case 5  
(Hamro Bazaar, 2020)

**ix) Monitor**

- **Name:** ASUS 24" 144Hz Gaming Monitor
- **Description:**
  - 24" FHD (1920x1080)
  - Refresh rate: 144 Hz
  - Response Time: 1 ms
  - Brightness: 350cd/m<sup>2</sup>
  - Ergonomic tilt, Swivel pivot, and Height adjustment
  - Input Connectors: DisplayPort, Dual-link DVI-D, and HDMI
- **Cost:** Rs. 58,800  
(Bigbyte, 2020)



Figure 26: ASUS 24"  
Gaming Monitor  
(Bigbyte, 2020)

**x) Keyboard**

- **Name:** Fantech Mk871 Mechanical
- **Description:**
  - Brand: Fantech
  - Item Model number: MK871
  - Replaceable mechanical switches
  - Illuminated RGB (Brown Switch)
  - 87 keys gaming keyboard layout
- **Cost:** Rs. 5,999  
(Daraz, 2020)



Figure 27: Fantech Mk871 Mechanical  
Keyboard  
(Daraz, 2020)

**xi) Mouse**

- **Name:** Fantech X7 Mouse
- **Description:**
  - Brand: Fantech
  - 6 programmable Keys
  - Model: X7
  - Connectivity: Wired
  - Weight: 135g
  - Voltage rating / electric current: DC 5V / 100mA
- **Cost:** Rs. 1,249  
(Daraz, 2020)

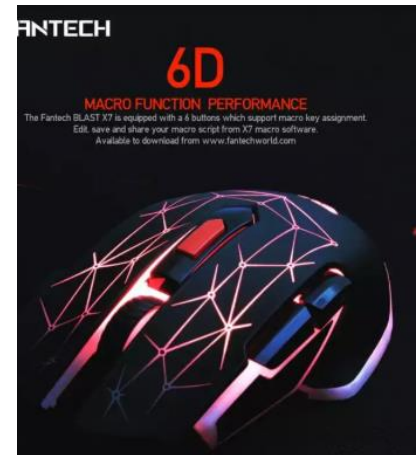


Figure 28: Fantech X7  
Mouse

(Daraz, 2020)

### Summarizing the budgeting and planning for a top range PC

S/N	Name of component	Description	Cost (NPR)	References
1.	Processor	Intel Core i7-9700K Processor	Rs. 57,800	(BigByte, 2020)
2.	Motherboard	MEG Z390 Ace	Rs. 53,150	(Chand, 2020)
3.	RAM	G.SKILL TridentZ 3000Mhz 32GB (2x 16GB) RAM	Rs. 30,999	(ITECH Store, 2020)
4.	GPU	iGame GeForce RTX 2060 SUPER Ultra 8GB OC	Rs. 62,800	(BigByte, 2020)
5.	Storage (SSD)	Addlink 568 - 512 GB SSD	Rs. 12,800	(Bigbyte, 2020)
6.	Power Supply	Power Supply Frontech 800 Watt	Rs. 3,200	(KinbechNepal, 2020)
7.	System Cooling	Seidon 120V plus CPU Liquid Cooler	Rs. 10,095	(PasalNepal, 2020)
8.	Case	Cooler Master Case 5	Rs. 19,000	(Hamro Bazaar, 2020)
9.	Monitor	ASUS 24" 144Hz Gaming Monitor	Rs. 54,800	(Bigbyte, 2020)
10.	Keyboard	Fantech Mk871 Keyboard	Rs. 5,999	(Daraz, 2020)
11.	Mouse	Fantech X7 Mouse	Rs. 1,249	(Daraz, 2020)
	Total		Rs. 3,11,892	

Table 9: Budgeting and planning for a top range PC

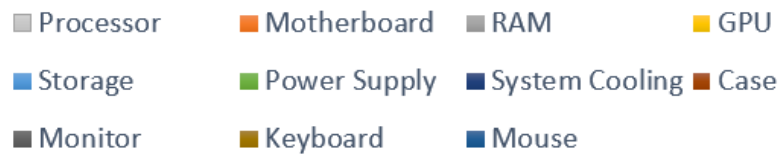
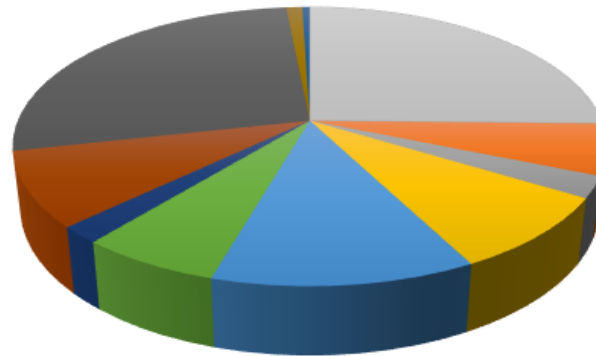
**Note: The total price of item does not contain delivery charges.**

## 10. Total cost of cheap and top range PC

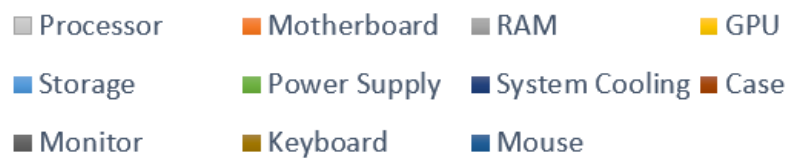
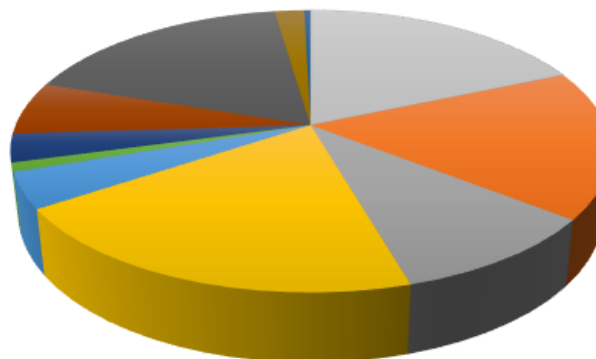
S/N	Name of component	Cost for Cheap range (NPR)	Cost for Top Range (NPR)
1.	Processor	Rs. 20,499	Rs. 57,800
2.	Motherboard	Rs. 4,799	Rs. 53,150
3.	Random Access Memory (RAM)	Rs. 1,999	Rs. 30,999
4.	Graphical Processing Unit (GPU)	Rs. 7,000	Rs. 62,800
5.	Storage	Rs. 9,800	Rs. 12,800
6.	Power Supply	Rs. 5,250	Rs. 3,200
7.	System Cooling	Rs. 1,563	Rs. 10,095
8.	Case	Rs. 7,000	Rs. 19,000
9.	Monitor	Rs. 21,800	Rs. 54,800
10.	Keyboard	Rs. 840	Rs. 5,999
11.	Mouse	Rs. 399	Rs. 1,249
	Total	Rs. 80,949	Rs. 3,11,892

## Summary of the finding:

### Price of components of the cheap range PC



### Price of components of the top range PC



## **11. Conclusion**

This report has been very beneficial for understanding different components of a computer system along with their market values. The research skill was greatly developed through the thorough research that this report required. The importance of each component of a computer system that is mentioned in this report was understood clearly. During the assembling of a cheap range as well as a top range PC, international and national websites were inspected and the price was compared which helped in understanding both the market values of components in Nepal as well as other countries. New data were collected about the components and a lot of information was gained which resulted in the completion of this report and the increment of knowledge regarding the components of computer system.



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