STELLAH ENGOSI SCM224-1064/2025

Information Technology for Statistics

Role of information Technology
Transport sector -use of cameras on roads to identify number plates.
Water - conveying information on whether people to move out and what to do.
Health - modelling i.e understanding the disease.
Agriculture - modelling of best grades for fertilizers.
Foreign affairs - tracking interaction between countries.
Tourism- tracking wildlife population and movement.
Education - calculation of summary statistics.
Environment - modelling i.e whether increase or decrease of temperature.
Finance- management of bills.

Fundamentals of computer operations

A computer is an electronic device that inputs data, processes it and gives out desired output.

Basic operations

IPO cycle: input, processing, output, storage

Main parts of a computer system

Hardware - keyboard, monitor,CPU

Software - windows,app

CPU components

ALU- perform arithmetic and logic operations

Registers- very fast temporary storage

CU- controls all activities

Basic computer operations

Booting

Running applications

Saving files

Shutting down safely.

Computer Hardware (1) - Input and Output devices
Input devices key in data
Output devices display information to the user

Examples of input devices
Keyboard - data entry
Mouse- navigating between files and folders
Microphone - for sound

Output devices
Monitor - display graphics and texts
Printer - produces hardcopy
Speaker- Audio output
Projector - enlarges display

Input/Output performance
Latency- time delay in response
Throughput- amount of data transferred per second
Bandwidth - maximum transfer rate

Computer Hardware (2)- storage devices and memory

Memory - components that store data and instructions used by a computer.

Primary memory (main) used by the CPU during processing.

1;RAM(Random Access Memory)- temporary, volatile memory. Data is lost when power goes off

Examples; DRAM,SRAM

2;ROM(Read Only Memory) - permanent, non volatile memory. Stores essential instructions for startup .

Examples; PROM, EPROM, EEPROM.

Primary memory is fast access, smaller capacity, expensive.

Secondary memory (storage devices)

Long term storage

Examples:

Magnetic storage devices - magnetic surfaces to store data e.g Hard disk drive

Optical storage devices - use lasers to read e.g CD, DVD

Solid state storage devices - use flash memory e.g flash drives, memory cards

Cloud storage - data stored online e.g Google drive,one drive etc.

Computer software

1; system software

Operating system (windows ,macos, Linux)
Utilities (antivirus, compression tools)
Device drivers

2; application software

Ms Word ,Excel, Access,Power point
Web browsers
Statistical packages (R SPSS)

Operating system functions

File management
Memory management
Process management
Security and user control
Input/ Output management

Data files and files management

Types of data files

Random files- access any record directly
Sequential file - records read in order
Structured file- organized e.g tables
Unstructured file- no fixed structure e.g videos

File operation

Creation
Editing
Retrieval
Indexing
Saving
Optimization

Databases - used to store structured datasets.