

COS 101

A FIRST CLASS SUMMARY

Courtesy of Comrade Madueke Sobechukwu (Mr. Muchmore)

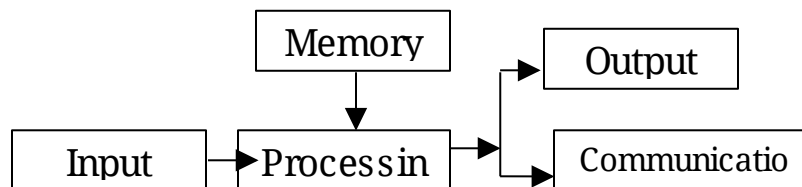
YES WE CAN

A GREATER NAMS IS A POSSIBILITY

“LET”s CREATE A UNION WE CAN CALL OUR OWN”

CHAPTER ONE

- Two group of resources found in a computer: hardware and software
- System: attain a common goal
- Basic (5) component (functional units): **input unit, storage (memory unit), CPU, output, communication unit**



- **Input unit:** Data in human sensible form is converted into data in machine or electronic form.
 - i. Capture or accept data
 - ii. Convert data into binary form called machine code
 - iii. Transmit converted data into area in the memory e.g trackball, touchpad, track point, graphic tablet
- **Storage unit:** 2ND function of the computer, primary storage &

BROUGHT
TO YOU
BY:
UFELE
CHRIS
OUR
INFORMA
NT

BROUGHT TO YOU BY:
UFELE CHRIS OUR INFORMANT

secondary storage (auxiliary or backing storage)

- i. **Primary:** RAM, ROM
 - ii. **Secondary:** magnetic storage (e.g cassette tape, floppy disk, hard disk), optical storage (e.g CD-ROM, CD-recordables, CD-Rewritables & DVD), solid state storage & flash memory devices.
- **CPU:** also called microprocessor or simply processor. It is an electronic circuit that executes computer programs. **Processing data means**
 - i. Manipulating
 - ii. Performing mathematical functions
 - iii. Rearranging
 - iv. Transformation

Microprocessor is the actual processing of data, “**brain**” behind the computational ability of the computer, it is an (IC) package that contains millions of transistors, the actual execution power of a processor depends on its clock speed or “heartbeat” measured in Hertz (cycle per sec).

- **Output:** 4th function “displaying information” e.g CRT monitor(Cathode Ray tube), printer, speaker
- **Communication:** 5th function, e.g modem, network interface cards, mobile phones. PDAs

- **Register:** faster processing

TYPES OF COMPUTER

- **Based on size:** 1. micro 2. Mini 3. mainframe
- **Micro:** has microprocessor as its CPU/often called PCs (to be used by one person at a time) e.g **PDA's, workstation, laptop, desktop**
- **Desktop:** not portable, can be CRT or LCD(**Liquid Crystal Display**) may lay flat or be a tower
- **Laptop:** LCD, has touchpad, expensive because components are small
- **PDA's:** on the screen with a stylus, communicates either with cable connection, IR beam, Bluetooth or radio waves
- **Workstation/server:** can be used by one or many user is a powerful, high-end microcomputer
- **Mini:** multi-user, uses powerful than a mainframe, uses **integrated circuit.**
- **Mainframe:** large, powerful computer that handles the processing for many users simultaneously. A **terminal** is a device that has a screen & keyboard for input & output but it does **not do its own processing** also called dumb terminals. Supercomputer: **cray 1** built 1976
- **Characteristics of computers:** are electronic, automatic, programmable, speed, digital, memory capacity, general purpose.....

- Constructing computers using combinations of similar standard components which allows for easy replacement of faulty components is called **modular structural design**
- A **bus** is a collection of parallel electrical conductors called “**lines**” onto which a number of components may be connected. **Basic type of bus**: internal & external buses
- A **register** is a small-sized (a few bytes) high-speed memory within the CPU.
- **Generally, buses may be used to convey**: data signals, data address signals, control signals & power
- ***Note** that bus interconnects devices through a set of parallel lines that are classified as **data lines** (data bus), **address line** (address bus) & **control lines** (control bus)
- **Three (3) distinctly different forms of architecture**:
 - i. Single– chip computers
 - ii. Single– board computers
 - iii. Multiple– board bus– based computers
- **Single– chip**: found in devices like watches, cameras
- **Single– board**: constructed on thin flat sheets of electrical board known as **Printed Circuit Boards** (PCBs)
- **Multiple– board bus –based**: many mini & mainframe are based upon this type of construction

- **Memory hierarchy** :the closer the memory is to the CPU, the faster (more expensive)
- **Register files**: (GPRs) & (FPRs), the register file represents the lowest level in our memory hierarchy, since it is closest to the processor. Can provide Operands directly to the ALU
- **Cache memory**: hold a small subset of the main memory. it is typically developed SRAM, which is faster than DRAM, but is more expensive, more power-hungry & less dense. SRAM does not need to be refreshed. **Cache contains the most recently accessed code & data.**
- **Main memory**: typically resides at the CPU chip, organized on banks, main memory is usually implemented in DRAM to take advantage of its low cost, low power drain & high storage density. DRAM need to be periodically refreshed since it is basically a tiny capacitor.
- **Program code movement: computer first turned on** →
- **Secondary (external) storage**:
Main disk storage is non – volatile because contents are maintained even when power is turned off.

CHAPTER TWO

Input: the data that can be captured into computer may be **classified** into the following: text, video, image, audio (sound) & visual signals

- **Text**: three set of symbols: letter, digits & special character, normal

user (textual document) but for programmer (source code)

- **Video/image:** scanner, digital cameras, thumbprint recognition device
- **Audio:** CD, DVD, Voice synthesizers
- A **pointing device** is any human outer face device that allows a user to input spatial data to a computer e.g mouse, trackball, glide pad, joystick, touch screen, touchpad e.t.c.
- **Terminals:** a terminal consist of a keyboard & a screen, so it can be considered an input device also called display terminals or video display terminals (VDT), A **dump terminal** has no ability to process or store data. E.g of smart terminal: PCS, POS (point- of- sale)
- **Multimedia:** Combination of sound & images with text & graphics
- A digital camera take still photos but record the pictures on computer disks or memory chip
- A video camera or recorder (VCR) records both still & moving
- Data automation → Goals → (1) avoid mistakes (2) avoid having to re-enter
- Credit card (magnetic strip)
- Bar codes (shoprite, game)
- Optical marks (score sheet)
- Magnetic ink (bank account)

CHAPTER THREE

OUTPUT

The computer output function is an activity in which a computer communicates information to the user.

- The **most common** output devices are visual display units (monitors), printers & speakers
- **CRT advantages:** cheaper, more durable and able to withstand being damaged, superior response time, superior contrast and there is no discernible flicker if the refresh rate is set to a sufficiently high value, also it is heavy and massive.
- **LCD monitor:** lighter and more compact, requires less electricity, tends to have better resolution and is built in considerably larger sizes. LCD does not flicker and is flat but causes eye strain.
- All monitors rely in a video card which is located on the motherboard to display the information.
- **PDP:** Plasma Display Panel, OLED→Organic Light – Emitting Diode and SED (Surface – conduction Electron – emitter Display)
- **Colour monitor:** CGA (Colour graphics Adapter → EGA (Enhance graphic Array) → VGA (Video Graphics Array) →super VGA

CHARACTERISTICS OF COMPUTER MONITOR

A **pixel** is the smallest unit on the screen that can be turned on and off or made different shade. **Closer the pixel, shaper the image.** Pixel or dots

(three dots: **red, green, blue**)

- **The size of the monitor is the size of the screen, not the size of the entire monitor.** Most dot pitch (0.28mm) (pixels, size, resolution, dot pitch, refresh rate, graphics adapter, magnetic fields, display characteristics, viewable area and productivity)

THREE TYPES OF COMPUTER MONITOR

1. **Cathode Ray Tube (CRT):** Monochrome, flicked (have fluctuating light) in their display, which causes eyestrain and the image quality is poor. Though cheaper and offered viewing angles close to 180°.
2. **Flat panel displays:** uses LCD, have active matrix and passive matrix. Active matrix (TFT) has higher refresh rate and better contrast, making a more brilliant display and more expensive. Portable computer use FPD because they are more compact and consume less power than CRTs.
3. **LCDs monitor:** suffer from dead pixels while CRTs do not. Are difficult to read in a strong light because they do not emit their own light.
4. **Gas plasma display (gas panel or plasma panel).** It combines three pixel colours (red, blue and green) to create an entire spectrum of colors, resulting in richer colours than LCD or CRT displays. Wide view angle, very costly. The **disadvantages** is that it must use AC power and cannot show sharp contrast.

Printer: Portrait and landscape refer to the orientation of the print on the page. **Portrait** format is when the height is longer than the width while **landscape** format is when the width is larger than the height. Monochrome

produces an image consisting of one colour. **Printer can be classified by their features such as quality, font, graphics, speed of printing, technology and resolution.**

- **Resolution** is the amount of dots printed per square inch
- Impact printer has more mechanical part and is noisy while Non-impact employ more electronic finesse.

IMPACT PRINTERS: It forms characters or images by striking a mechanism such as a print hammer or wheel against an inked ribbon, leaving an image on paper. (mechanical contact between paper and printing head) e.g **dot-matrix, daisy-wheel and line printer.**

Dot-matrix and daisy-wheel are **serial** (character) printers, meaning that they print one character at a time. Only the daisy-wheel is capable of producing true letter quality output on plain paper.

NON-IMPACT PRINTER: is faster and quieter, no physical contact between printing mechanism and paper e.g **inkjet, laser and solid ink.**

INK-JET PRINTER: Printing low cost compare to laser printer, shower and somewhat lower resolution than laser, may require use of special coated paper, it takes time to print colour graphics, pages take longer time to dry.. **advantage** = resistance to alteration

LASER PRINTER (TONER BASED PRINTER): Relatively high-speed, uses the process of electro-photography or xerography, uses static electricity, both laser and ink-jet use dot to create images. Popular because it produce sharp, crisp images of both text and graphics providing good resolution 300-1200 dpi, print in many font. Uses PDL (software) (page description

language) describe the shape and position of letters and graphics to the printer. E.g. **of pin** are postscripts, from adobe systems and Hewlett-packard graphic language (HPGL), color laser jet printer use toner that is (maybe) **black, cyan, magenta and yellow** to create all the colours of the rainbow, not designed to handle photo paper.

- **Toner of laser is dry while ink jet is wet**
- Ink-jet ink needs replenishing more frequently than laser. Advisable to use ink-jet for small number of work but laser for high volume
- Multifunction printer (MFP) or all in one (do all: print, fax, scan and copy)
- **Solid ink:** (or phase change printers) is a type of thermal transfer printer. Produces excellent result – drawbacks of the technology include high energy consumption and long warm-up times from a cold state. also user also complain of the print being difficult to write on, as the wax tends to repel inks from pens and are difficult to feed through documents feeders used on calculators and fax machines.
- **PLOTTERS:** Creates a hard copy version of a digitally rendered design. **Plotters differ from printers** in that plotters use **continuous lines** to create images where as printer can only simulate lines by printing a closely packed spaced series of dots. Much slower because of mechanical motion necessary to draw detailed graphics using continuous lines. More expensive than printer. “plotters are printer but not all printers meet the specifications to be considered plotters , not able to print photo quality images like laser, take up lot

of space, slow”.

- **ZONK TECHNOLOGY:** zero ink or inkless printer
- **SPEAKER:** Sound cards convert digital data to analogue sounds that comes out as output through the computer system.
- **BIOS:** Basic input and output system (RAM and ROM or solid state memory) (voice coil actuator or motor)
- **NTQ (Near typeset Quality)**
- **CAD (Computer Aided Design)**

CHAPTER FOUR

COMPUTER STORAGE

- ❖ Central memory (RAM)
- ❖ Generally, the lower a storage is in the hierarchy, the less its bandwidth and the greater its access latency from the CPU. (Primary, secondary, tertiary and offline storage).
- ❖ **Primary storage:** (Main memory or internal memory) only on directly accessible to the CPU. Any data actively operated on is also stored there in uniform manner. Primary stored(memory bus/connected directly)CPU.
- ❖ A bus is a group of wires on the main circuit board. It is a pathway for data flow between components. Most devices are connected to the bus through a controller.

- ❖ Two more sub-layers of the primary storage:
- ❖ **Processor register** located inside processor, hold typically word data of 32 or 64 bytes. Technically among the fastest of all form of computer data storage.
- ❖ **Processor cache:** intermediate, solely to increase performance of the computer. Most actively used info on the main memory is just duplicated on the cache memory, which is faster, but of much lesser capacity. Much slower but, much larger than processor register.(any piece of information can be accessed at any time)
- ❖ **RAM:** The more RAM in your computer the larger the programs you can run. (the capacity of a memory chip is measured in byte), volatile in that it loses information stored in them during power failure. “nothing permanent is kept in the main memory” (very closely connected to the processor, contents are quickly and easily changed, holds the programs and data that the processor is actively working with interacts with the processor millions of times per sec).
- ❖ **ROM:** Access to information may be randomly or sequentially, non-volatile primary storage. (primary storage has no moving part)
- ❖ **SECONDARY STORAGE:** not directly accessible to the CPU, non-volatile, less expensive e.g Standalone RAM disks, zip drives, paper tape, punch cards.

DIFFERENT FORM OF DISK STORAGE

1. **MAGNETIC DISK STORAGE:** (MDS) most used, **Advantage:** higher storage capacity, reliability and it gives direct access to data. The

head **read and write data** to plotter. Only one head is active at a time. The information held in one sector(a block) is the unit of transfer between the disk and primary memory.

❖ The time taken to access a particular block consist of the following:

1. Time to move heads to the right track(seek time)
2. Time waiting for the sector to come around to the head latency
3. Time to actually transfer the data (block transfer time). **1 and 2 variable. cylinder**= (a set of corresponding track on different platters)
2. **Hard disk drive (HDD)** commonly called hard drive, hard disk or fixed disk drive, non-volatile. Hard disk are much more expensive than the floppies. (care must be taken for the head/write head to avoid contact with the disk) “turning the computer off and quickly back on before spinning has stopped could cause a greater damage to the hard disk

DISK FORMATTING: Sets up a method of assigning addresses to the different area, allow one to efficiently use the space while still being able to find things stored in a disk.

DVD: Digital Versatile Disk

DVD -ROM → stands for digital Video Device or Digital Versatile Device Read Only Memory.

CLUSTERS: One cluster is the minimum space used by any read or write head to read or to write data. The computer keeps track of what it has put where on a disk by remembering addresses. When a disk is formatted the

following takes place.

1. All data is erased
2. Surfaces are checked for physical and magnetic defects
3. A root directory is created to list where things are on the disk

Non – magnetic storage e.g optical disks (e.g CD and DVD disk)

- ❖ The DVDs and CDs that are commercially produced on the **Write Once Read Many** (WORM) variety.
- ❖ Flash memory storage device e.g USB drive
- ❖ **Types of tape** (magnetic tape), tape cassette and tape reel
- ❖ **Tertiary storage system** typically refers to a data storage system that uses drives that accept removable media, a storage rack for the removable media and a robot arm to transfer media between the storage rack and the drives.

Storage capacities: expressed in bytes, a group of 8 bits is called a byte, one byte typically represents a single character such as a number, a letter or symbol. Most computers operate by manipulating groups of 2, 4, or 8 bytes called Words .

Kilo → Mega → Giga → Tera

2^{10} (1024) 2^{20} 2^{30} 2^{40}

1TB = 1024GB = 1,048,576MB

VOLATILITY, MUTABILITY, ACCESSIBILITY, ADDRESSABILITY AND

PERFORMANCE

Latency is the time it takes to access a particular location in storage

HISTORY OF COMPUTER

- ❖ The Von Neumann architecture unified our current computing hardware implementations. Since the Von architecture, control of the data path is stored in the memory, so it is an automatic process.
- ❖ Digital computing elements have ranged from mechanical gears, to electromechanical relays, to vacuum tubes, to transistors, and to integrated circuits, all of which are currently implementing the Von Neumann architecture

Human calculators: astronomical ephemerides artillery firing tables, or for nautical navigation was specialized, expensive, requires rigorous training in mathematics.

- ❖ The earliest counting device was probably a form of tally stick
- ❖ The abacus was used for arithmetic tasks.
- ❖ For astronomical calculation: Antikythera mechanism and astrolabe from ancient Greece.
- ❖ The “castle clock” and astronomical clock invented by Al-Jazari in 1206, is considered to be the earliest programmable analogue computer.
- ❖ John Napier (Scottish Mathematician and physicist) invented Napier's bones for multiplication and division
- ❖ **Slide rule 1620:** does multiplication and division

- ❖ **German** Wilhelm Schickard build the first digital mechanic calculator in 1623, and thus became the father of the computing era. Made use of “cogs” and “gears” so called “calculating clock”

Von Leibniz (1671) once said that “it is unworthy of excellent men to lose hours like slaves in the labour of calculation which could safely be relegated to anyone else if machines were used”

- ❖ 1820, Charles Xavier Thomas (based on Leibniz) created the first successful mass-produced calculator that can add, subtract, divide, multiply.
- ❖ ENIAC (1945)
- ❖ Japan, Ryoichi Yazu (1902) consisted of a single cylinder and 22 years “based 2 and base 5”
- ❖ 1725 (Basile Bouchon)
- ❖ 1726 (Jean – Baptiste Falcon) semi automatic and required manual feed
- ❖ 1801 (Joseph – Marie Jacquard) → punched card
- ❖ 1833 Charles Babbage: Difference to analytical engine
- ❖ 1835, Babbage described his analytical engine employed punch-cards and a steam engine for power
- ❖ In 1890 the US census Bureau used punched cards sorting machines PST and tabulating machines designed by Herman Hollerith
- ❖ The most powerful computers on earth are needed to adequately model its weather using the Navier – Stokes equations

- ❖ 1948, Curta was introduced, small, portable, mechanical calculator that was about the size of a pepper grinder
- ❖ The first all-electronic desktop calculator was the British Anita Mle-Vil which used a nexie tube display and 177 subminiature hydration tube
- ❖ The model EC-132 added square root and reciprocal functions.
- ❖ LOCI-2 → can compute log (1965)
- ❖ Water integrator (1928) using the as the analogue quantity
- ❖ A planimeter as a device which does integrals using distance as the analogue quantity
- ❖ The art of analogue computing reached its zenith with the differential analyzer. Invented in 1876 by James Thomson and built by H.W. Niemen and Vannevar Bush
- ❖ The decimal precision of a digital device is a limitation
- ❖ Alan Turing's 1936 paper presentation
- ❖ Konrad Zuse, started Z in 1936 and finished it 1938 never worked because of problem with the precision of parts K3=based on telephone relay became the first functional program controlled, AU purposed, digital computer
- ❖ EDASC design (1949) British
- ❖ Colossus was the first totally electronic computing device having values (vacuum tubes), paper-tape input, not turning complete.

- ❖ 1937, Claude Shannon logic gate stuff
- ❖ The first computing machine ever used remotely, in the case a phone was the complex number calculator by Stibitz
- ❖ 1939, John Vincent Atanasoff and Clifford E. Berry developed Atanasoff-Berry computer (ABC) → solely linear elements used vacuum tubes, first to use electronic tubes in an adder.
- ❖ ENIAC Co inventor John Mauchly examined ABC in June 1941
- ❖ Mark I, started 1939, directed by Howard Aiken, officially known as Colossus → could not add
- ❖ In 1959, IBM sold its first magnetic disk system, RAMAC (random access method of accounting and control) EDH (electronic design automation) automatic sequences controlled calculator, not Turing complete.
- ❖ ENIAC used particle process (US built) → electronic Numerical integrator and computer was the first electronic general purpose computer (add or sub) could also multiply divide and square root. Turing complete could compute anything that fit in memory
- ❖ First generation (Von Neuman Machines) 1947
- ❖ EDVAC: Electronic discrete variable automatic computer (used in single processing unit)
- ❖ UNIVAC (June 1951 was used for US census first mass produced computer, used 5200 vac and 125 kw used a memory delay line capable of storing 1000 words of 11 decimal digits plus sign 72 but

work your memory)

- ❖ The first implemented high-level general purpose programming language → Fortran
- ❖ Zuse 1945, was the first built the programming language
- ❖ Second generation Von Neumann machines: transistors (bipolar junction transistor) replaced our gere vacuum tube. Current flow (1), current blockage (0)
- ❖ Transistor volume is measured in cubic millimeters compared to vacuum tubes' cubic centimeters
- ❖ The IBM 350 RAMAC (1956) was the world's first disk drive
- ❖ Third generation and beyond: post 1960
- ❖ Relied on Jack St. Clair Kilby's and Robert Noyce's independent invent don of the integrated circuit (or microchip) which later lead to the invention of microprocessor by Ted Hotti Federico Faggin and Stanley Mazor et litel
- ❖ CAM → content addressbale memory
- ❖ First stored program computer → EDSAC performed fist calculation may 6, 1949 and was the computer that fan the first graphical computer game
- ❖ First personal computer → coined "item" by Ed Robert in 1975 when he introduced Altair 8800. But Renback – 1 is the first personal computer

- ❖ Micral is the first commercial non-assembly computer
- ❖ First work station: Xerox alto (1974)
- ❖ First laptop or portable computer: Osborne 1 developed by Adam Osborne
- ❖ First PC (IBM Computable): IBM PC in 1981 code named “Acorn” had 8088 processor, 16kb memory and utilizing ms-DOS
- ❖ First PC clone: developed by Compaq and released in March 1983
- ❖ First Apple Computer: Steve Wozniak designed the first Apple known as the apple 1 computer in 1976
- ❖ First computer company: electronic control company (1949) by ECKUT and Mauchly that created ENUAC, but catch renamed EMMC or Eckent- Mauchly computer

CHAPTER SIX

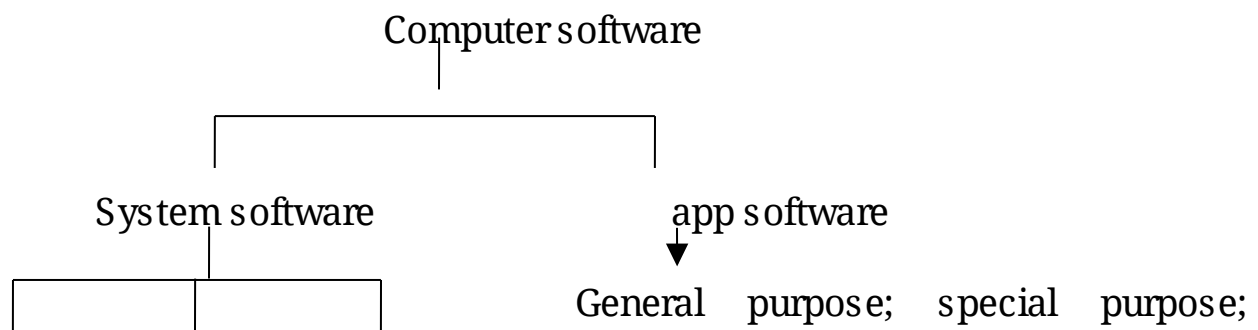
COMPUTER SOFTWARE

- ❖ **Computer program:** Sequence of instructions.
- ❖ **Computer software:** set of computer programs held in computer storage
- ❖ The actions, procedures, functions or processes which the computer can perform can be expressed in several rotations (called languages).
- ❖ Hierarchy of language used to write programs → starts from hardware and rise towards the human (highest level)

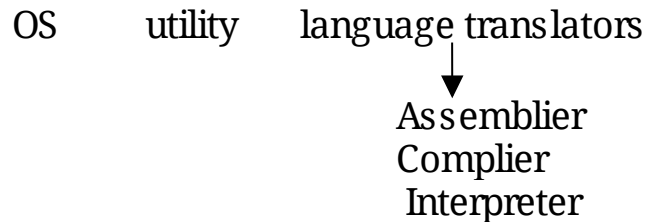
- ❖ Microcode is a layer of hardware– level instructions used to implement circuit-level operations involving registers, buses, multiplexers e.t.c
- ❖ A sequence of microcode instructions to perform some task is called microprogram.
- ❖ Machine language (binary or hexadecimal) lowest level language available to the programmer of a processor (native language) microcode translates machine language instructions into sequence of detailed circuit level operations.
- ❖ When the same numeric substrings of machine language are given more human symbols or memories to create assembly language, it is translated by Assembler.
- ❖ High-level programming language: a programming language with strong abstraction away from the details of the CPU. “with no mention of the details”
- ❖ A program in high level language is translated into machine language by a program called compiler.
C, C++, J AVA, C#, python, Ruby
- ❖ When the entire program must be translated before any execution can start the translator is called compiler. E.g of HLL →BASIC, C++, J AVA, C# and Pascal
- ❖ Very high level programming language (VHLL) or goal – oriented programming language: a programming language with a very high

level of abstraction, e.g Matlab, Python, SQL and ruby

- ❖ Execution models: 3 general model for modern high level language programs: → interpreted, compiled and translated.
- ❖ Two form of compilation: (a) to machine code (b) intermediate code (byte code)
- ❖ TCP → Transmission control protocol
- ❖ IP → Internet protocol
- ❖ Native-code build process: this auxiliary code is stored in packages called libraries. The process for building a high level program to native code. Source code → compiler → object code → linker(<-- library modules) → executable
- ❖ Byte code build process:
- ❖ The user control the hardware by means of software.
- ❖ Application software: a program that perform some human oriented task
- ❖ System software: a program that performs general duties required for the execution of other programs



bespoke



- ❖ Firmware used on device: DVD player, microwave, mobile phones, oven

Software hierarchy

Electronic or physical devices, micro-architecture and machine language
—> control unit and data path

- ❖ The hardware and the instruction set, form the instruction set architecture. This level is also referred to as machine language level
- ❖ Receive command and issue equivalent command —> device driver
- ❖ A user interface is a system by which a user interacts with a machine to manipulate the system.
- ❖ A window manager is a systems software that ctrl's the placement, appearance of windows
- ❖ Once the OS software and the app software is indistinguishable to the user we call it —> firmware —> often held in rom and flash memory
- ❖ A common name for modifying or replacing a device firmware is “flashing” the device. Replacing the firmware with a third party version is called “rooting” the device

- ❖ Internal bus: used within a computer to link its ALU, CU and other internal registers
- ❖ External buses: used to connect separate elements together such as connecting the processor to T/O unit. Buses used to cover data sign. Data address control sign and power.

Flowchart, pseudo code and narrative is used to describe an algorithm

Hierrarcies of language : ML > AL > HLL > VHLL

CHAPTER SEVEN

PROBLEM SOLVING

- ❖ Problem solving process consist of the following technical activities: algorithm development, flowcharting or pseudocoding and coding in a programming language.
- ❖ Standard problem solving method: top down and bottom top.
- ❖ Algorithm can be defined as a logical sequence of steps that can be followed to solve a particular problem.
- ❖ The technical term that we use to describe the process of outlining or providing or writing sequence of steps that solve a particular problem is designing computer-based algorithm.

CLASSIFYING ALGORITHM

- ❖ As a result of transiting from one step to the other, the following types of algorithms can be indentified: linear, selective and repetitive.

STRUCTURE ALGORITHM

- ❖ **Selective structure algorithm:** selective manner, one might be chosen in the face of alternative.
- ❖ **Features of a good algorithm:** correctness, thoroughness, clarity, simplicity, efficiency
- ❖ The difference between an algorithm (pseudocode or flowchart) and a program (Programming language : BASIC, C, C++, C#, JAVA, Pascal, Delphi, modular 2) is the language of expression.
- ❖ Processing in a program that solves a particular problem is expressed using any of the following statements: assignment statements, selective logical statements and repetitive logical statement.
- ❖ Knowing how to program requires good program design which consist of the following (1) algorithm design (2) data design (3) program structure design and interface design
- ❖ Interface → user friendly addresses the issue of good interaction between user and the program
- ❖ Algorithm design: ensures that the program is correctly and efficiently written
- ❖ Data design: ensures that data requirement of the program is stored, accessed and processed by the program
- ❖ Program structure design: involves choice of good control structure that will enable the programmer to easily write, read, debug and

maintain the program with ease.

CHAPTER EIGHT

BASIC LANGUAGE PROGRAMMING

BASIC: Beginners' All – Purpose Symbolic Instruction Code

Written as a separate statement.

When there is “jump” we call it transfer of control.

- ❖ Components of BASIC string is a sequence of characters but do not include quotation marks.
- ❖ Declaration: is to place a request with the language translator for memory space for the data object.
- ❖ Precedence of arithmetic operations

ENMIMA

- ❖ Boolean Operations: (logical operations) is one that evaluates to either true or false
- ❖ Logical operators: NOT, AND, OR, XOR, EQV, IMP
- ❖ The syntax of a statement consists of the parts and order in which these parts are put together to obtain an error free statement.
- ❖ Loop structures: situation when a program may be required to execute a particular task several times until a certain result or condition occurs.

JAVA LANGUAGE PROGRAMMING

**BROUGHT TO YOU BY:
UFELE CHRIS OUR INFORMANT**

Developing a java goes through five stages → edit, compile, load, verify and execute

Process of building a java program

Editor → compiler → verifier → interpreter

COMPUTER NETWORKING

Network consist of a cabling system and a common protocol or language that the compilers use to communicate with each other

Basically: peer – to – peer network

Client/server networks

Basically three types of sever: file sever, pront server and application server

Types of network: LAN, MAN, WAN, or long haul network

TYPES OF CABLES

Basic three (3) types used in LANs today? Twisted pair coaxial and fiber optic.

Twisted → can be UTP (unshielded twisted pair) or STP

Coaxial → provides a large band width (BW) of up to two MHZ, support high data transfer rates two main types: baseband and broadband.

Optical fiber → 125 microns of outer diameter best because of its excellent electrical noise immunity, difficult to trap, light weight, small in

size and less prone to vandalization

- ❖ Internet connection is simply the way that your computer gains access to this data communications network in the internet
- ❖ Internet server (host) remains connected to the internet in order to serve client computers “browsing or surfing”
- ❖ Text link usually appear as blue or green underlined words

URL (uniform resource locator): just a web page address. It specifies the web server that stores the page, a special formatted address that a web browser uses to locate, retrieve and display a document.

UFELE CHRIS WISHES YOU SUCCESS IN YOUR EXAM.

Getting the right information at the right time is your right and we are here to provide it for you with passion.