Module 1-2:Overview of Software and Hardware

Week 1-2

Learning Outcomes:
After completing this course you are expected to demonstrate the formal languages:

- *Describe and explain the physical components of Hardware*
- *Distinguish the difference between System and Application Software.*
- *Discuss the components of Basic Computer.*

A. Engage

Trivia: The template for all modern computers is the Von Neumann architecture, detailed in a 1945 paper by Hungarian mathematician John von Neumann.

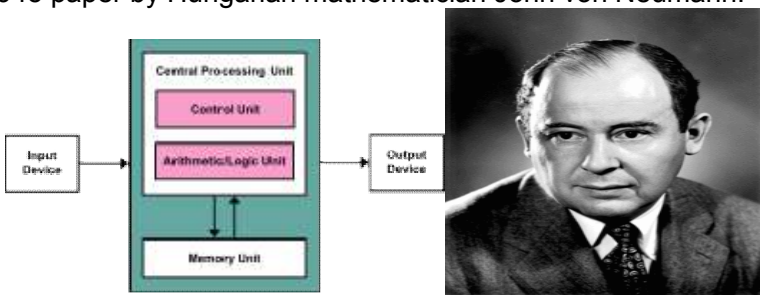

Figure 1
Von Neumann architecture,John von Neumann

B. Explore

YouTube Link: https://www.youtube.com/watch?v=vG_qmtdBPTU

Video Title: **Computer Science Basics: Hardware and Software**

C. Explain

Computer Hardware and Software

Introduction

A computer fresh off the assembly line with no software in place can do absolutely nothing. It can't accept characters from the keyboard, display data on screen, execute or even start an application program. Hardware presents a most unfriendly interface, and even experienced programmers find it difficult to communicate directly with the raw iron.

D. Elaborate

Hardware and Software

Hardware refers to the physical elements of a computer. This is also sometime called the machinery or the equipment of the computer. Examples of hardware in a computer are the keyboard, the monitor, the mouse and the **central processing unit**. However, most of a computer's hardware cannot be seen; in other words, it is not an external element of the computer, but rather an internal one, surrounded by the computer's casing (tower). A computer's hardware is comprised of many different parts, but perhaps the most important of these is the **motherboard**. The motherboard is made up of even more parts that power and control the computer.

In contrast to software, *hardware is a physical entity*. Hardware and software are interconnected, without software, the hardware of a computer would have no function. However, without the creation of hardware to perform tasks directed by software via the central processing unit, software would be useless. **Hardware** is limited to specifically designed tasks that are, taken independently, very simple. **Software** implements *algorithms* (problem solutions) that allow the computer to complete much more complex tasks.

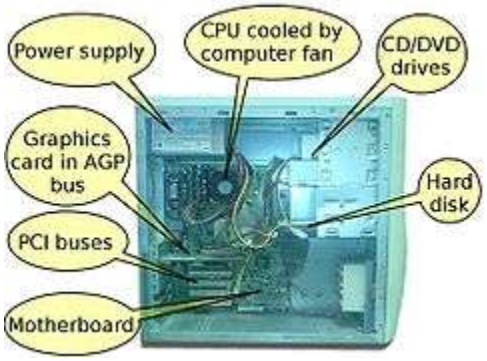

Figure 2: Basic Internal Hardware

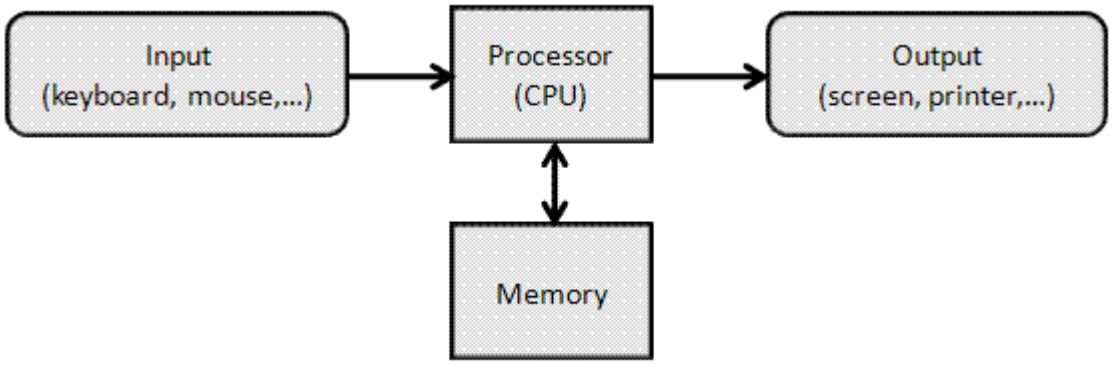

Figure 3: Basic Operations

Input is whatever goes into the computer. Input can take a variety of forms, from commands you enter by keyboard to data from another computer (via a network connection) or device (via direct or network connection). A device that feeds data into a computer, such as a keyboard or mouse, is called an *input device*.

Output is any information (data) that comes out of a computer. *Output devices* can be other computers, display screens, speakers, and printers.

Storage

Computer data storage is referred to as storage or memory, which can save digital data. Examples are RAM, hard disks, CDs, DVDs and removable flash memory sticks.

Permanent, or non-volatile, storage devices do not require power to remember the data stored. Mass storage devices, like your hard disk, are non-volatile; a loss of power does not affect their ability to retain data. This category also include ROM (Read Only Memory).

Temporary or volatile storage is more often called "memory". A loss of power means that any data stored will be lost irretrievably. When you are using an application, such as a word processor, the data (the document you are working on) is stored in RAM (Random Access Memory). If you lose power without explicitly saving your work, you will *likely* lose data.

Processing

The processor is the brain of a computer. It's also called the *CPU* (Central processing unit) and it is a microchip. For a non-programmer, this is where all the real action is. Programs just set the stage and direct the play. (In this off hand analogy, the play itself, in written form, would be most like a program.

Software, commonly known as programs or apps, consists of all the instructions that tell the hardware how to perform a task. These instructions come from a software developer in the form that will be accepted by the *platform* (operating system + CPU) that they are based on. For example, a program that is designed for the Windows operating system will only work for that specific operating system. Compatibility of software will vary as the design of the software and the operating system differ. Software that is designed for Windows XP may experience a compatibility issue when running under Windows 2000 or NT.

Software is capable of performing many tasks, as opposed to hardware which can only perform mechanical tasks that they are designed for. Software provides the means for accomplishing many different tasks with the same basic hardware. Practical computer systems divide software systems into two major classes:

- **System software:** Helps run the computer hardware and computer system itself. System software includes operating systems, device drivers, diagnostic tools and more. System software is almost always pre-installed on your computer.
- **Application software:** Allows users to accomplish one or more tasks. It includes word processing, web browsing and almost any other task for which you might install software. (Some application software is pre-installed on most computer systems.

E. Elaborate

ASSESSMENT:
Instruction: may use google forms for questionnaire composition, and share link to correspondents. Possible time allocation 20mins – 30mins.

CONTENT FOR ASSESSMENT: 5 PTSEACH

1. Distinguish between reading and writing memory.
2. Distinguish between physical memory and its contents.
3. What is Software?
4. How are input / output and secondary storage devices similar? How are they different?
5. Briefly Explain CPU.

Reference:

http://cs.sru.edu/~mullins/cpsc100book/module02_introduction/module02-05_introduction.html

Contact Information of the Facilitator

Name :*Placides Michelle&Shiela B. Hernandez*

MS Teams Account (email):

Smart Phone Number : *09216995041*