COMPUTER APPLICATION

Introduction to the computer

Computer is an electronic device that can receive data input and process it to get the result as an information

Electronic Data Processing (EDP) is a manipulation from a row data to a useful Information

Introduction to the computer

Data Processing Cycle

Computer System

Introduction to the computer

Computer System is a collection of hardware and software components designed to provide an effective tool for computation.

Hardware is actual equipment used to perform the computations.

Introduction to the computer

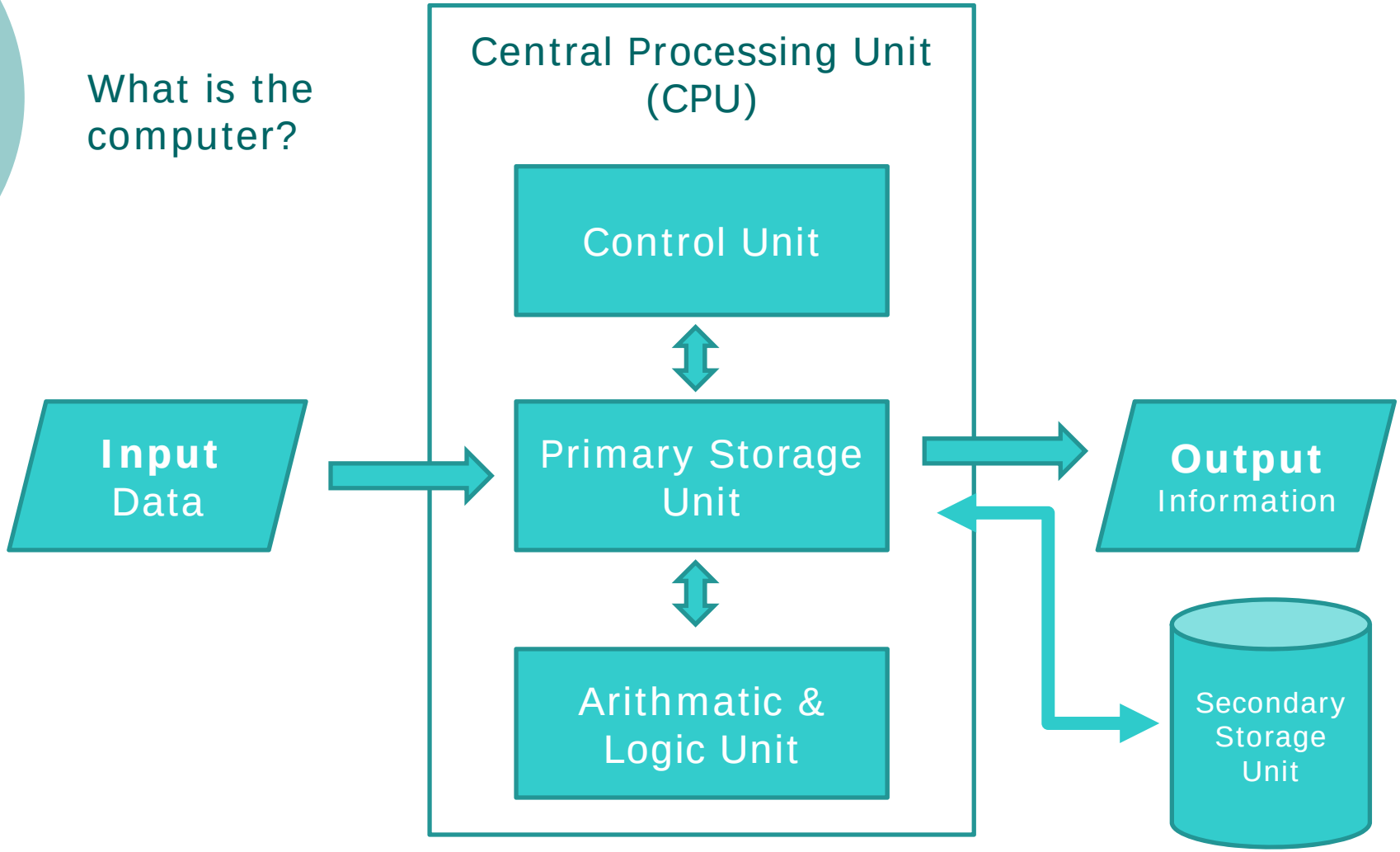
Software is programs enabled us to communicate with a computer by providing it with the list of instructions it needs to operate.

All Computers, from the very smallest microsystem to the largest mainframe, consist of three basic components:

- »Memory
- »Central Processing Unit (CPU)
- »Input/Output devices

Introduction to the computer

What is the computer?



Introduction to the computer

Central Processor Unit (CPU)

- Coordinating all computer operations
- Performing arithmetic and logical operations on data
- Contains two subcomponents

  Arithmetic/Logic Unit (ALU)

  – Carries on all types of calculation (arithmetic and logical operations)

Introduction to the computer

Control Unit (CU)

- Controls the actions of the other components.
- Examples, *Operating under the control of instructions from the programmer (these instructions reside in memory), the control unit causes data to be read from the input devices, passed the appropriate values from storage to arithmetic/logic unit for the required calculations, stores and retrieved data and intermediate results from main memory, and passes results to the output device for display*

Introduction to the computer

Input Devices

- **Keyboard Devices**

- **Pointing Devices:**

  Mouse, Trackball, Touch Screen, Light Pen, Remote Control Unit

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- **Optical Reading Devices:**

  OCR (Optical Character Recognition)

  - optical mark reader, optical character reader, handprint reader

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- **Magnetic Reading Devices**

  EFT (Electronic Funds Transfer) :

  - automatic deposit, automatic tranfer, Automated Teller Machine (ATM)

- **Speech Recognition Devices**

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Output Devices

- **Displayed Output Devices :**

  Display Screen, Monitor, Cathode Ray Tube (CRT), Video Display Terminal (VDT)

- **Printers :**

  Line Printers, Character Printers, Page Printers

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- **Speech Output Devices**
- **Plotters**
- **Microfilm**

Introduction to the computer

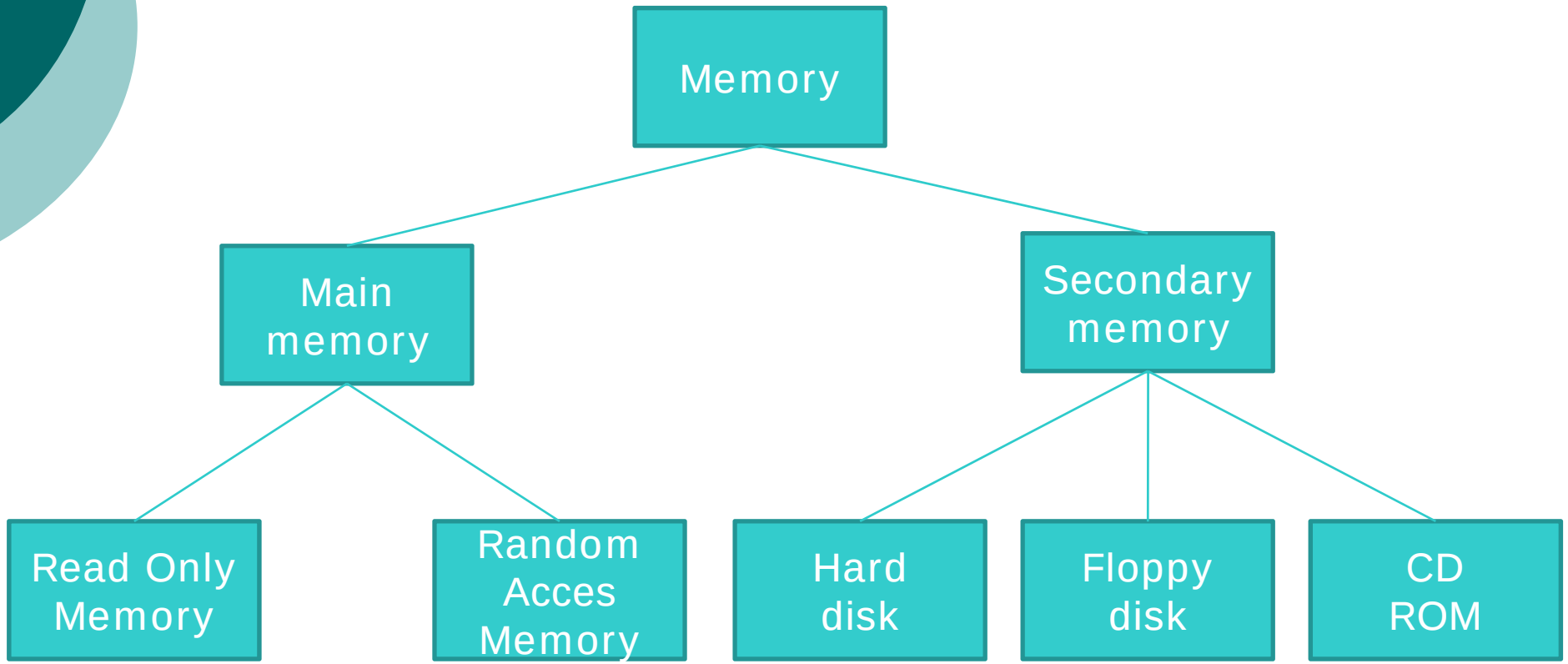
Every computer comes with a certain amount of storage, both *internal storage (memory), and external/ secondary storage.*

The two forms of storage differ in *characteristics and in purpose.*

Introduction to the computer

Program currently in execution, along with some of the data required for execution, must be reside in memory.

Introduction to the computer



Types of memory

Introduction to the computer

MAIN MEMORY

- **Read Only Memory (ROM):**
  - Stores information permanently (*not volatile*).
  - Stores the boot instructions needed to start-up the computer when it is switch on.
  - Is written by the manufacturer.

Introduction to the computer

- **Random Access Memory (RAM):**
  - Is usually volatile memory.
  - Temporarily stores programs while they are being executed and data.

Introduction to the computer

- **Cache Memory**

  Checked by the processor prior to looking for a needed program instruction or data in regular RAM.

Hardware Development

- First Generation (1946-1959)
- Second Generation (1960-1965)
- Third Generation (1966-1975)
- Fourth Generation (1975 - Now)
- Accessories

Software Development

- System Software
  - operating system
  - utility system
  - language translator

Software Development

- **Operating System**
  - Without operating system, a software application or a program language software can‘t communicate with the computer.
  - Operating System is just like a brain on human body which organize all process inside a human body

Software Development

There are six basic functions that an operating system can perform :

1. Schedule Jobs
2. Manage Hardware and Software Resources
3. Maintain Systems Security
4. Enable Multiple User Resource Sharing
5. Handle Interrupts
6. Maintain Usage Records

Software Development

- **Utility Programs**

  Utilities enable users to copy files, erase files, sort the content of files, merge two or more files together, and prepare removeable storage media for use. Other utilities allow the computer operations manager to recover lost or bad files, monitor performance of the system, and event control the flow data between users and computers.

Software Development

- **Language Programming**

  There are three different kind of Language programming:

Machine language

Low level language
Assembler

High Level language
Fortran, Lisp, Algol, Cobol, RPG, Basic, Pascal, Prolog, C, Matlab, etc

Software Development

- **Machine Language**
  - A computer's native language, containing instructions that are binary numbers.
  - It is difficult for human to learn and use.
  - Instructions to the control unit must be expressed in terms of the machine language of the particular computer.

Software Development

- A machine language instruction conveys the *operation to* perform and the *operands, or memory cells, that are to take part.*

- Example, compute the cost of an item

cost = price + tax

Software Development

001	Load	Copy the value of the memory cell addressed into the accumulator
010	Store	Copy the value of the accumulator into the word addressed
011	Add	Replace the present value of the accumulator with the sum of its present value and the value of the memory cell addressed
…		
111	Halt	Terminate execution

Sample Instruction Set

Software Development

- **Assembly Language**
  - Is programming language in English-like abbreviations
  - Later be converted into machine code by program's translator called assemblers

Software Development

- Example, adds to number and store in another variable

```
LOAD A
ADD B
STORE C
```

Software Development

- **High-Level Language**
  - A programming language whose instructions resemble every day language
  - Has a **language standard** that describe the grammatical form (syntax) of the language
  - Every high-level language instruction must conform to the syntax rules specified in the language standard.

Software Development

- Example, BASIC, C, C++, COBOL, FORTRAN, LISP, PASCAL, Java

- Example of C++ code,

  cost = price + tax;

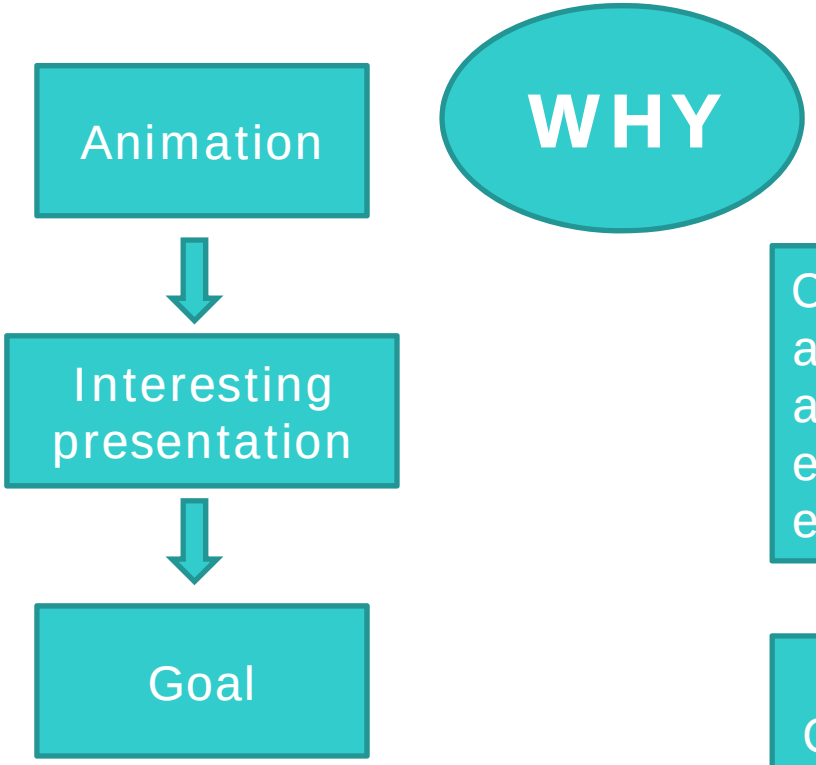
Software Development

Software Application

- Presentation
- Image processing
- Multimedia
- Internet

Software Development

- Presentation application



WHY

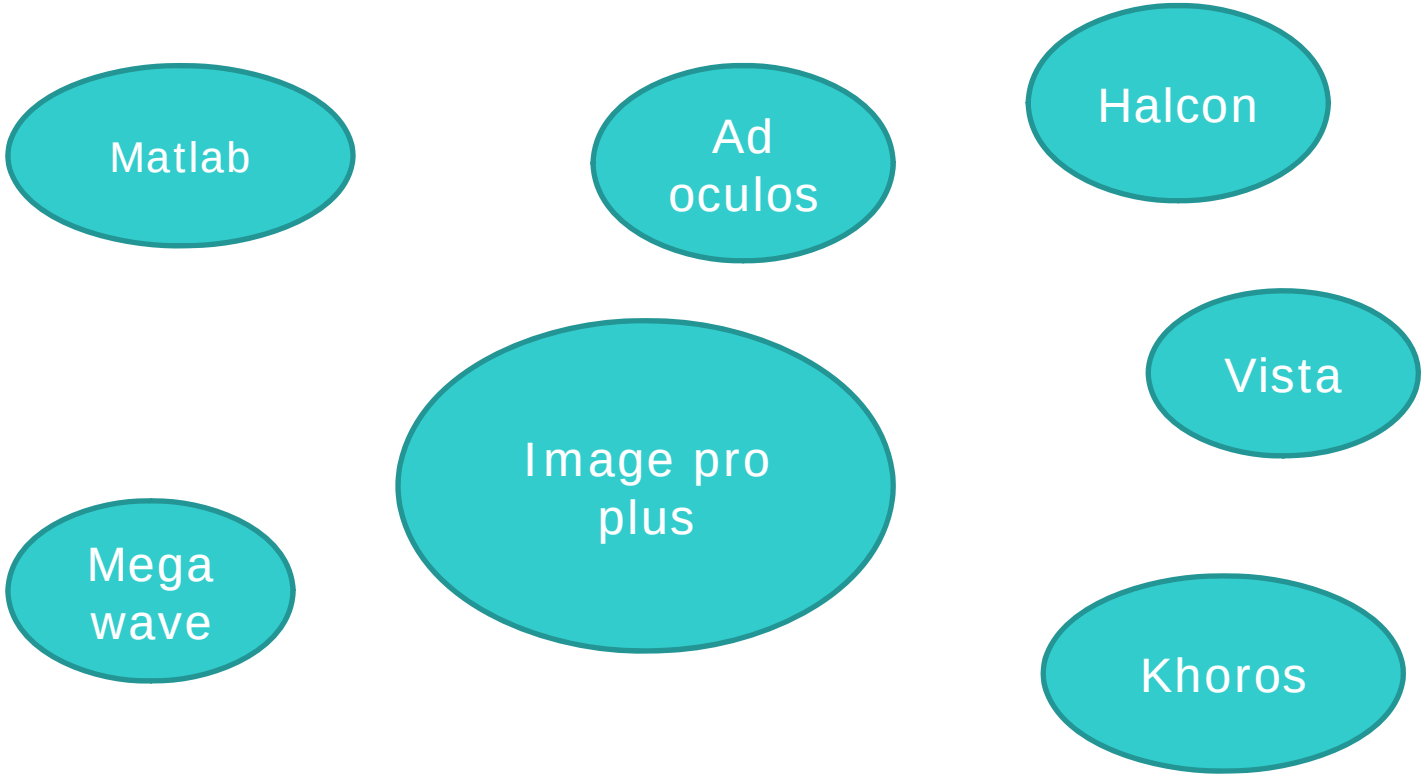
POWER POINT

Can be embedded from another software applications, such as word, excell, picture, video, audio, etc

Can be converted to html file

Software Development

- Image processing application



Software Development

- Image processing application

Easy to program

Many library especially for image processing

Can be compiled with C++ compiler

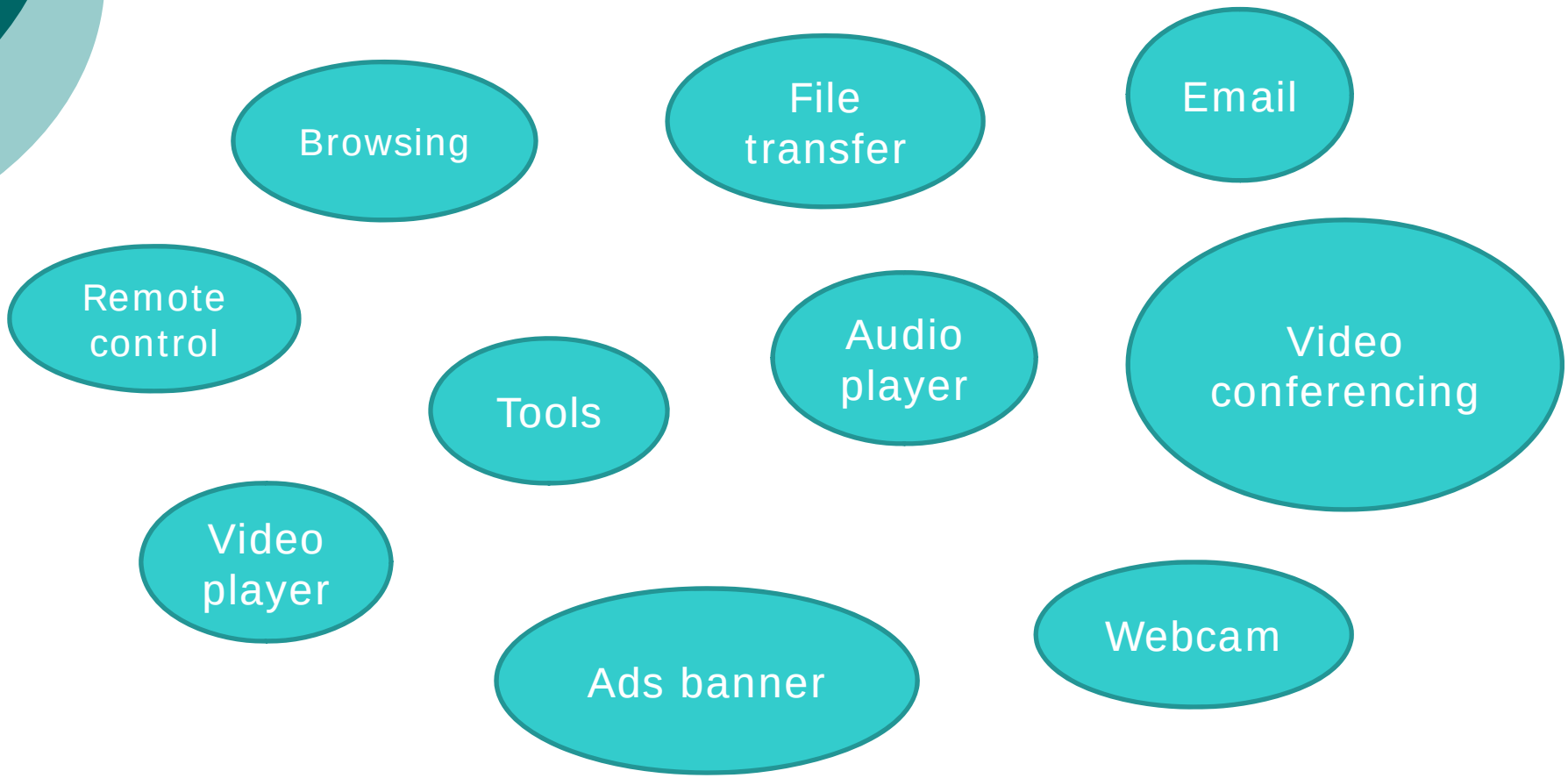
Interactive program

MATLAB

WHY

Software Development

- Internet & Multimedia



Software Development

Internet

worldwide collection of computers connected together by a network communication channel.

Benefit of Internet

- **Electronic mail (E-mail)**
  - one form of communication where an individual can use to send mail to another person or to a complete list of addresses.

Software Development

- **Sites**
  - another form of communication to access other people's files or information

World Wide Web (WWW)

the collection of sites across the world that offer information

Software Development

- To visit the site, we must have
  - Web Address / Uniform Resource Locators (URL)
    - http://www.cnn.com
    - http://www.au.ac.th
    - http://www.infoseek.com
  - Computer, communicating devices (MODEM, LAN card) and web browser

Software Development

- **Web browser**
  - A program that allows us to type the address and send messages asking for information from that site.
  - Browser companies: Microsoft's Internet Explorer (IE) and Netscape