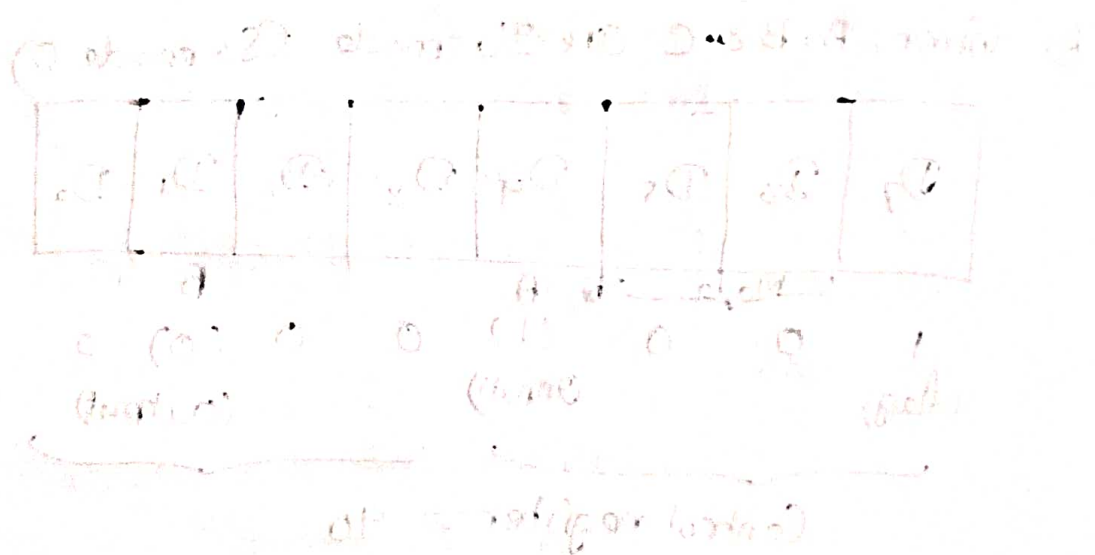1) What is an operating system?

2) Describe how OS can be used as a user-computer interface

or

Draw the computer hardware & software structure.

3) What are the different services provided by OS?

4) Describe the work of OS as a resource manager.
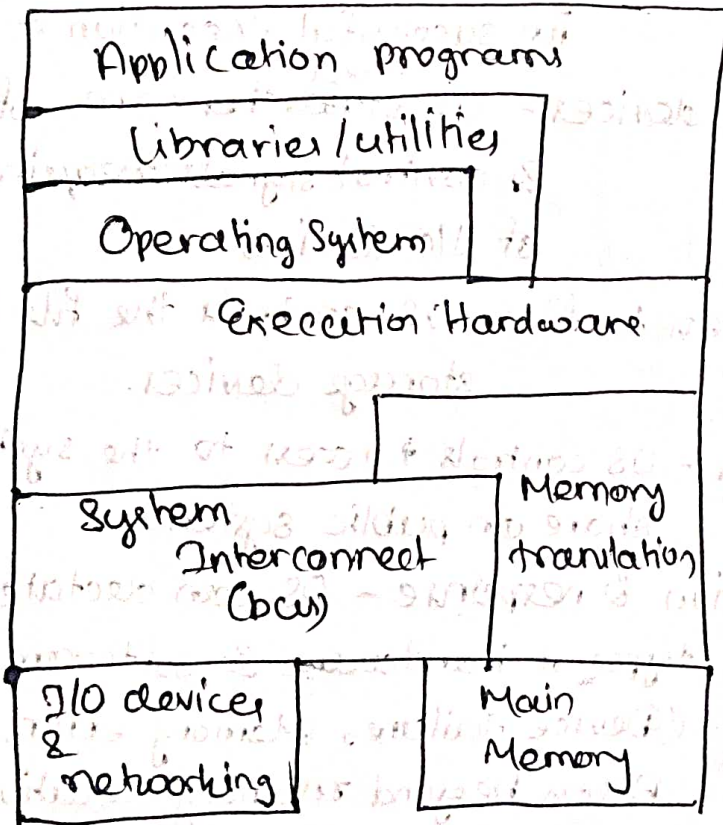
5) What are the diff^n types of OS ?

1) OS is a program that controls the execution of application program
* It acts as an interface b/w the application and the computer hardware.
* It has 2 main objectives.
 (i) Convinience - OS makes a computer more convinient to use.
 (ii) Efficiency - It allocos the computer resources to be used in an efficient way

* OS can be used in 2 diff" ways.
 (i) OS as a user-computer interface
 (ii) OS as a resource manager.

2)

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┌──────────────────────────────────────────┐
│  ┌──────────────────────────────┐         │
│  │    Application programs       │         │
│  │  ┌────────────────────────┐   │         │
│  │  │   Libraries/utilities  │   │         │
│  │  │ ┌────────────────────┐ │   │         │
│  │  │ │ Operating System   │ │   │         │
│  │  └─┴────────────────────┴─┘   │         │
│  │         Execution Hardware     │         │
│  │              ┌─────────────────┴───┐    │
│  │   System     │    Memory           │    │
│  │   Interconnect│   translation      │    │
│  │     (bus)     │                     │    │
│  │ ┌──────────┐  └──┌──────────┐──────┘    │
│  │ │ I/O device│    │  Main     │           │
│  │ │ &         │    │  Memory   │           │
│  │ │ networking│    │           │           │
│  └─┴──────────┴─────┴──────────┴───────────┘
```
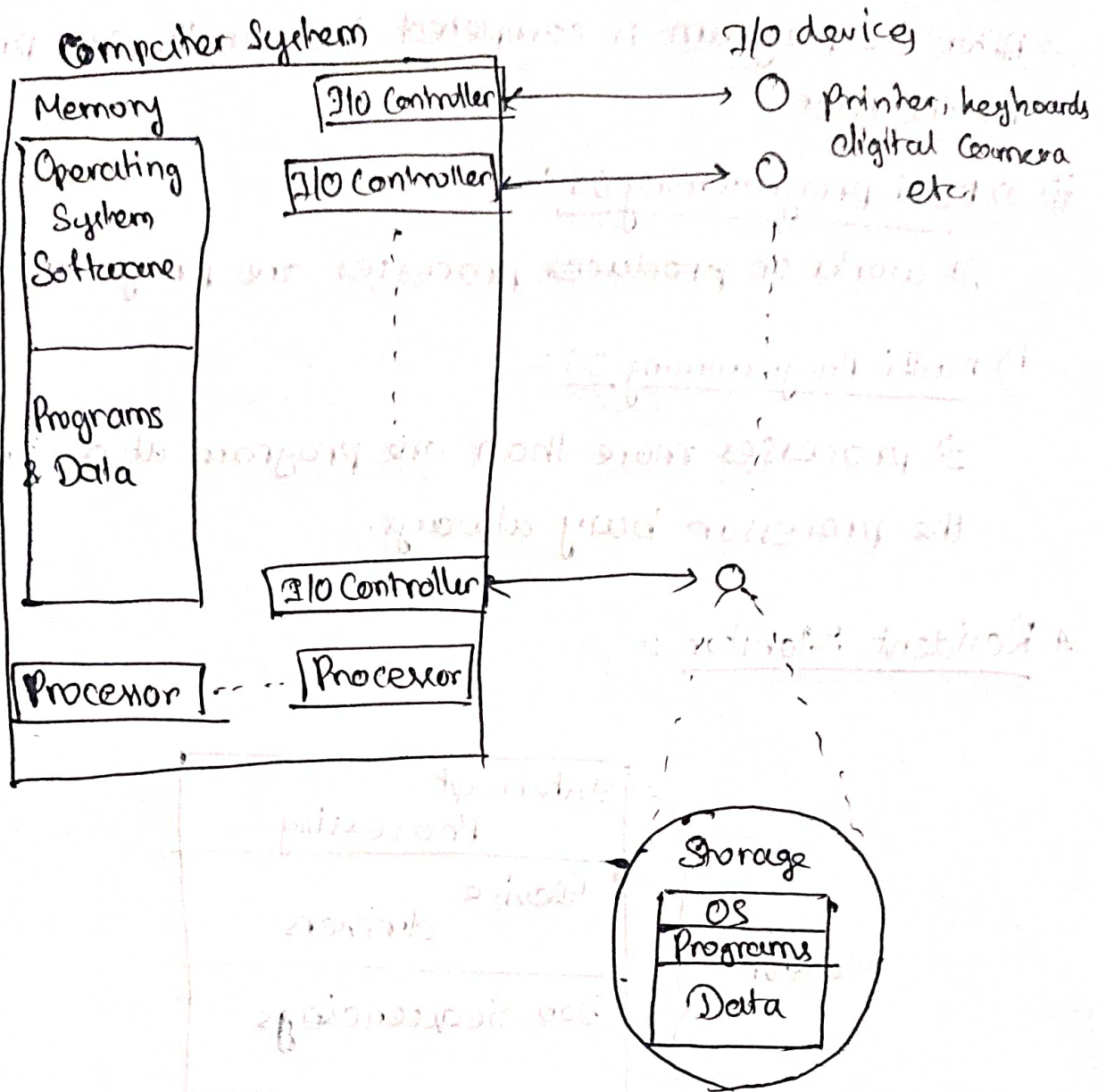
- The application program can be written in any programming language
- Utilities/libraries helps us in program creation, manages the files & controls the I/o devices.
- The most important system program is of OS.
- The OS hides the details of hardware from the programmer & provides him with a convinient interface to use the processor
  Application

Interface → Application programming interface
          Application binary interface
          Instruction set architecture

3) The OS provides the following services.
   (i) Program creation - OS provides diff^n types of facilities & Services like editors, debugers, interpreters etc. to help the programmer in creating new programms.

   (ii) Program Execution- OS supports all the steps, &(Instruction & data are loaded into main memory, I/O devices address allocation, file initialization etc), needs for successful execution of a program.

   (iii) Access to I/O devices - OS takes care of the instructions & control signals required for the operation of I/O devices

   (iv) Controlled access to files - OS controls the file format on the storage devices.

   (v) System access :- OS controls & access to the system in case of share on public systems.

   (vi) Error destection & response - OS can dectate & correct diff^n types of hardware & software errors (Device failure, Memory error, Arithmatic overflow Access beyond memory location) etc) when the system is running

   (vii) Accounting - OS collect the statistics for the diff^n resources connected to the procesor.

Computer System — I/O devices diagram:
Memory (Operating System Software, Programs & Data), I/O Controllers connected to I/O devices (Printer, keyboards, digital camera etc.), Processor — Processor, Storage (OS, Programs, Data)

Types of OS

i) a) Interactive OS
   b) Batch OS

ii) a) Uni-programming OS
    b) Multi-programming OS

i) a) Interactive OS :-

The user or programmer increases directly with the computer through a keyboard or display terminal.

b) Batch OS :-

→ The user's program is batched together with the program from other users and submitted by a computer operator

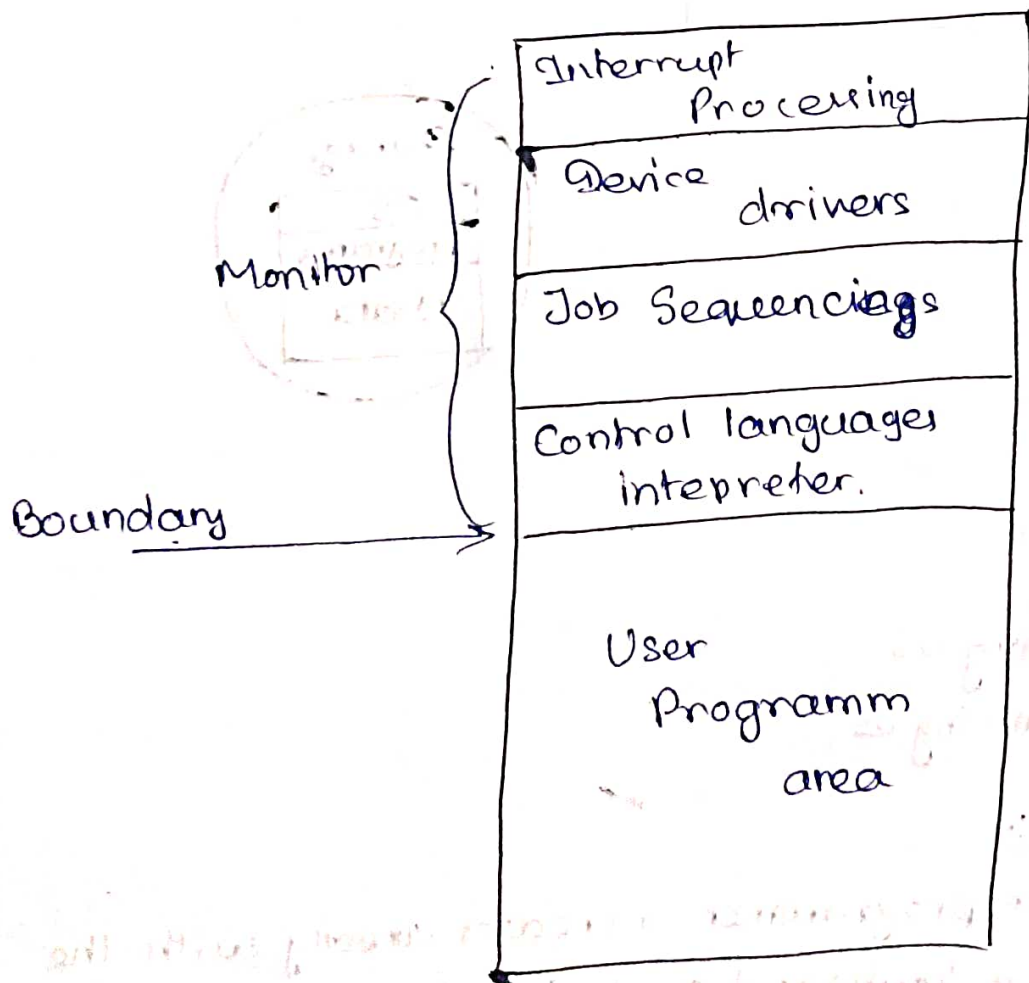→ After the program is completed the results are printed out for the user.

ii) a) Uni-programming OS :-

It works or produces processes are program at a time

b) Multi-Programming OS :-

It processes more than one program at a time and keeps the processor busy always.

* Resident Monitor :-

Monitor

Boundary

Interrupt Processing

Device drivers

Job Seqeencings

Control languages intepreter.

User Programm area

i) From the point of view of user in Batched OS systems, the monitor controls the sequence of events.

ii) So, the ~~numbers~~ monitor should always be present in the main memory and available for execution. This portion is refered to as resident monitor.