Operating System

IDE	Editor	Browser	Music player	----

Interface

Operating System (Kernel)

control program Resource mgr

CPU	RAM	Keyboard	Monitor	Harddisk

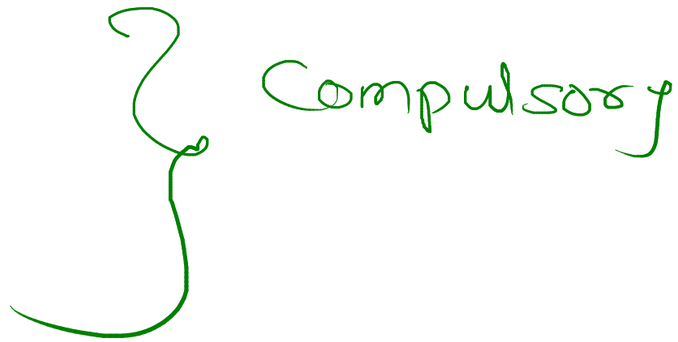
- 'interface betn end user and hardware
- 'interface betn application s/w & hardware
- control program which controls execution of programs.
- resource manager/ allocator who is managing all h/w resources.

- CD/DVD/ISO - Core OS + Appln s/w + System Utilities

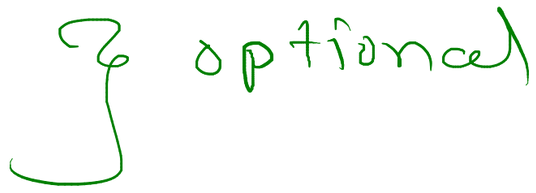
(Kernel)

kernel Functionalities

1. Process Management
2. CPU Scheduling
3. Memory Management
4. File and IO Management
5. Hardware Abstraction

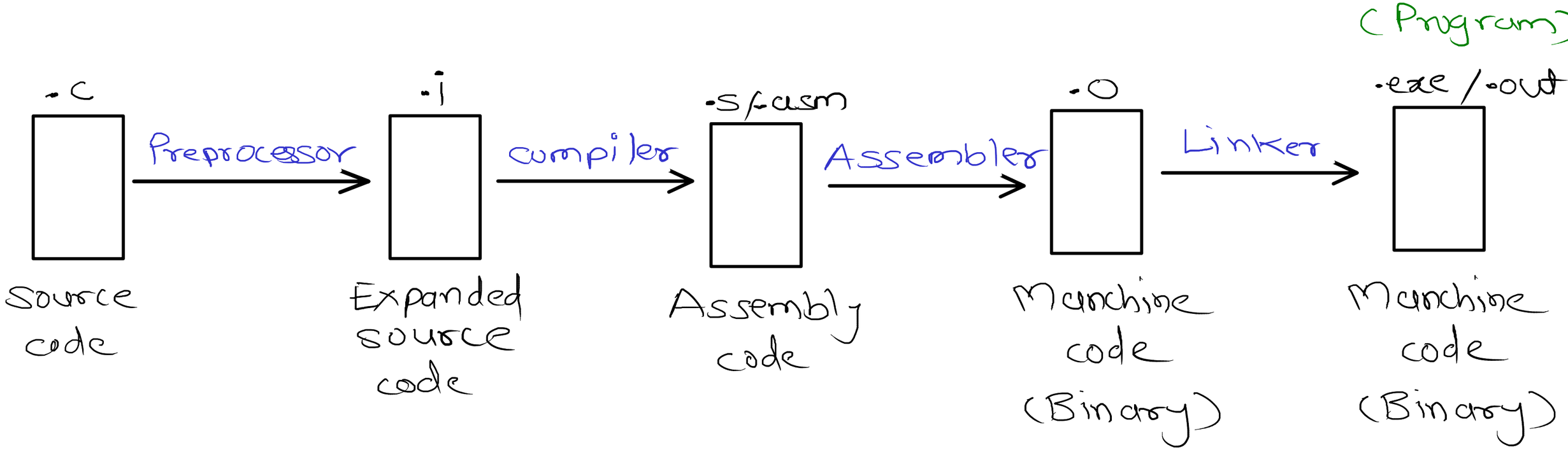


6. User Interfacing
7. Networking
8. Security and Protection



Process Management

Process - Process is program in execution.
Program - set of instruction to the machine (CPU).



GCC - GNU Compiler Collection (Toolchain)
- set of tools (programs)
- preprocessor(cpp)
- assemebler(as)
- debugger(gdb)
- Compiler(cc1)
- linker(ld)
- utilities(make, objdump)

Program

(Program)

(Sectioned binary)

(Executable file)

Executable Header

1. Magic number - Identity to file format
   - first 2 or 4 bytes of binary file
   - .exe - Portable Executable(PE) - MZ
   - .out - Executable Linking Format(ELF) - ?ELF
2. Type of application - CLI/GUI/Library
3. Address of entry point function
4. Information about remaining sections - size, start, end

Text

- instructions are kept into machine code format

Data

(int num=10;)

- all static and global variables are stored (initialised)

BSS (Block Started by Symbols)

(int num2;)

- all static and global variables are stored (uninitialised)

RO Data (Read Only)

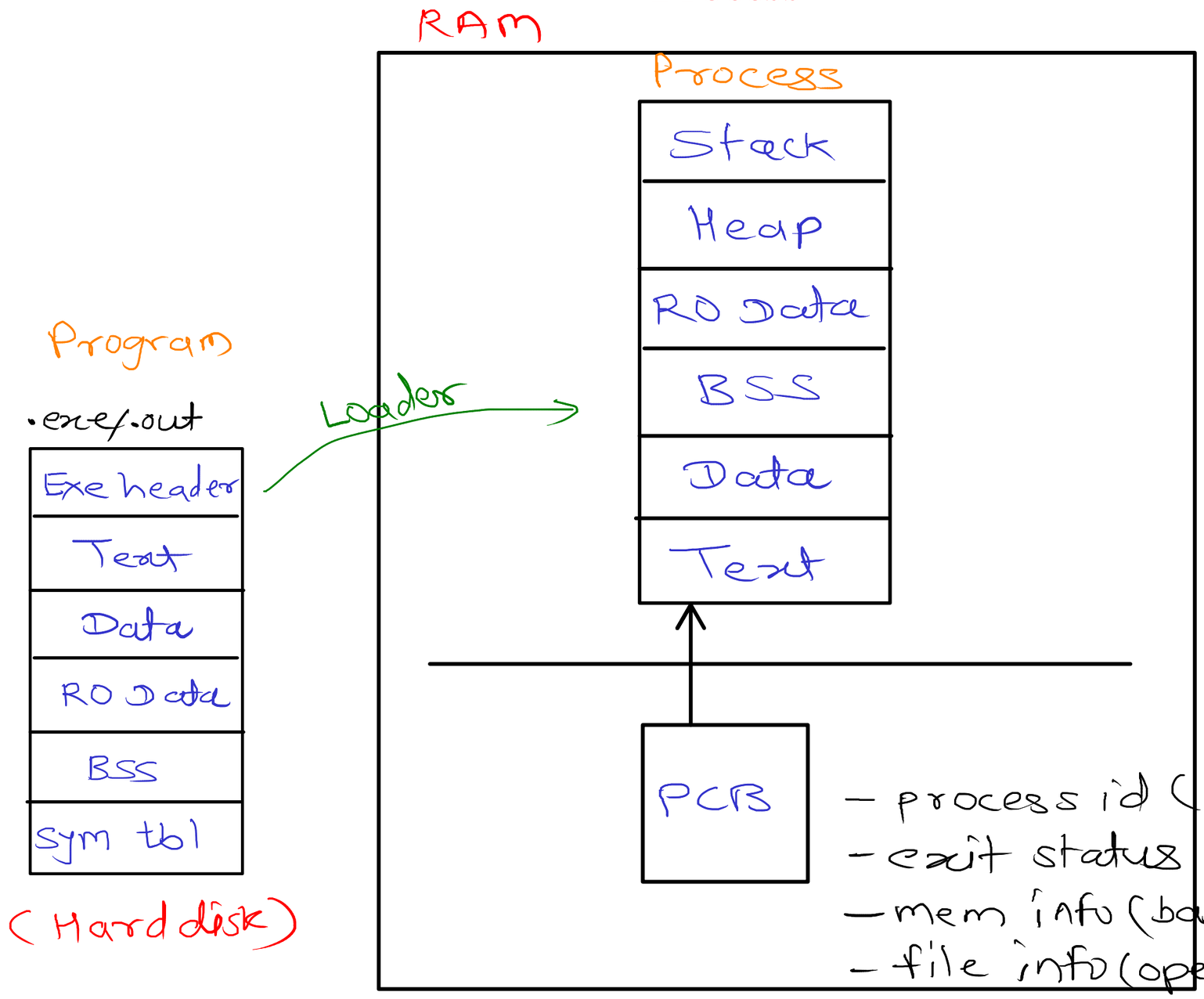
(char *ptr="sunbeam";)

- read only data is stored (string constant)

Symbol Table

- information about symbols
- symbols
  - Variables (type, size, address, section, value)
  - functions (name, address, return type, no of arguments)

Process



Stack

Local variables(FAR)

Heap

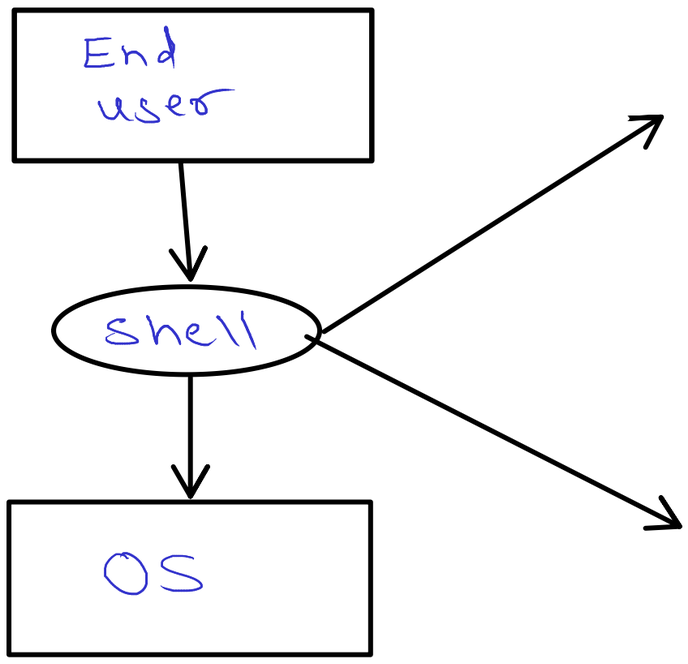
Dynamically allocated memory

PCB

- Process Control Block
- info needed to execute program into memory

User Interfacing

- user interfaccing is done by program and called as "Shell".
- shell is interface between end user and operating system
- shell is command interpretor



CLI Based (Command Line Interface)

Windows : cmd.exe, powershell.exe
Linux : sh, bsh, bash, csh, ksh, zsh, ...

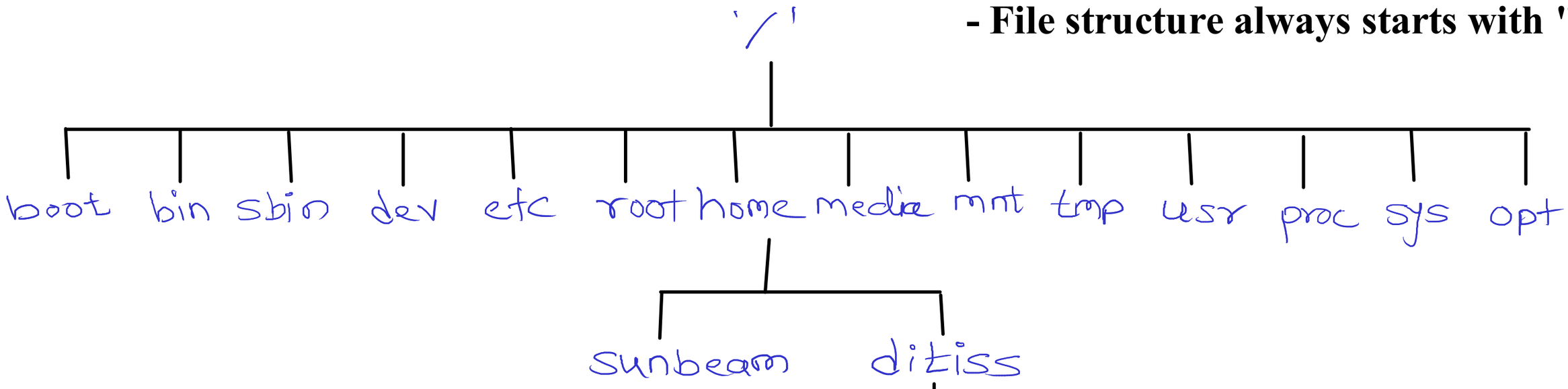
GUI Based (Graphical User Interface)

Windows : explorer.exe
Linux : GNOME (GNU Network object Model Env)
KDE (Kommon Desktop Env)

Default shell - bash (Bourne Again Shell)
Terminal - Application of GUI which intern runs shell (bash)
commands - instructions given to the OS

Linux File Structure

- Linux follows root file structure
- file --> file
- folder --> directory
- File structure always starts with "/"



Path

- uniqe location of files
- consist of letters and '/'

1. Absolute path

- path always starts with '/'

eg. /home/ditiss/linux/Assignments/assign01.pdf

2. Relative path

- path always starts with respect to current dirctory

eg. linux/Assignments/assign01.pdf