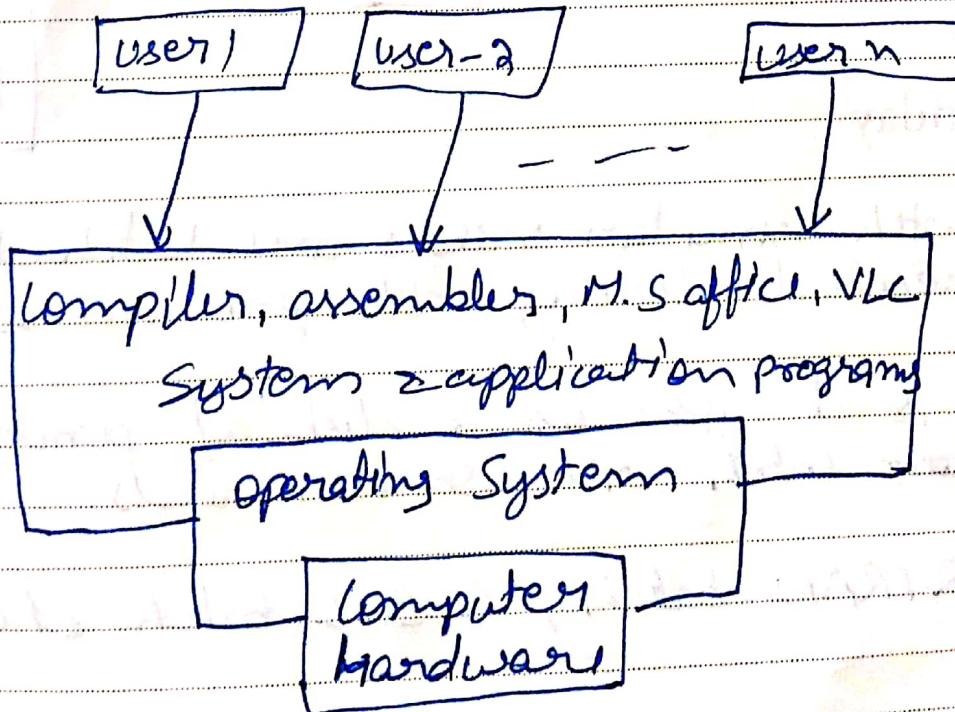


Operating System

- A operating System is system Software
- * It act as an intermediary b/w H/w & user
- * Resource Manager - Manage system resources in an unbiased fashion both h/w & s/w
- * Provides a platform on which other applications programs are installed

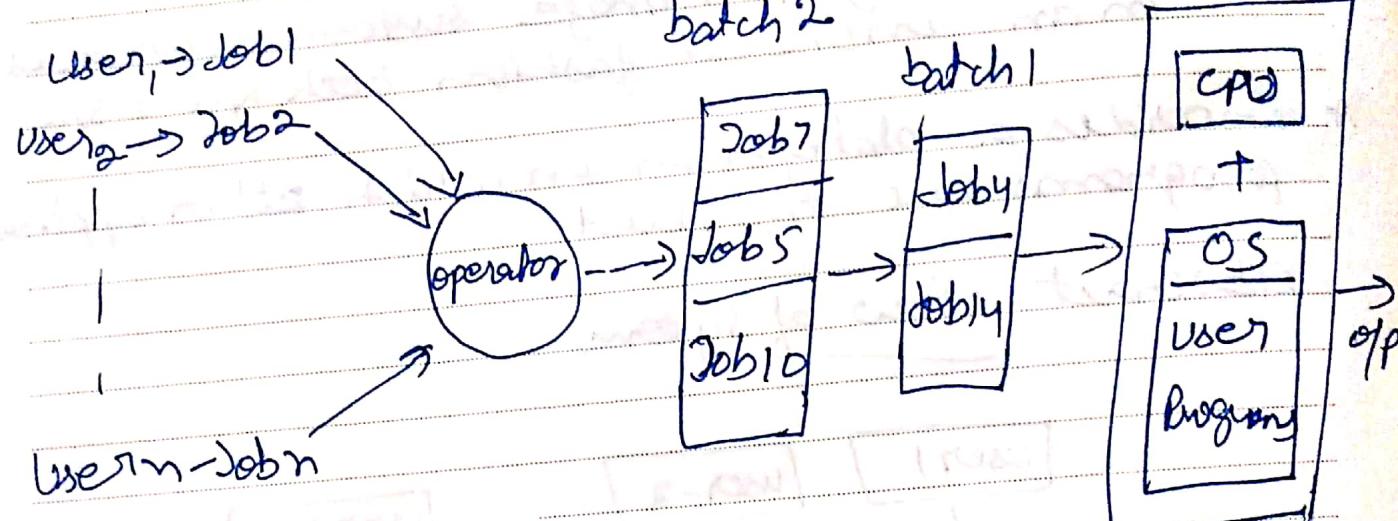
Abstract view of System:



MARCH 2014													
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8

Saturday

Types of OS① Batch OS:

9

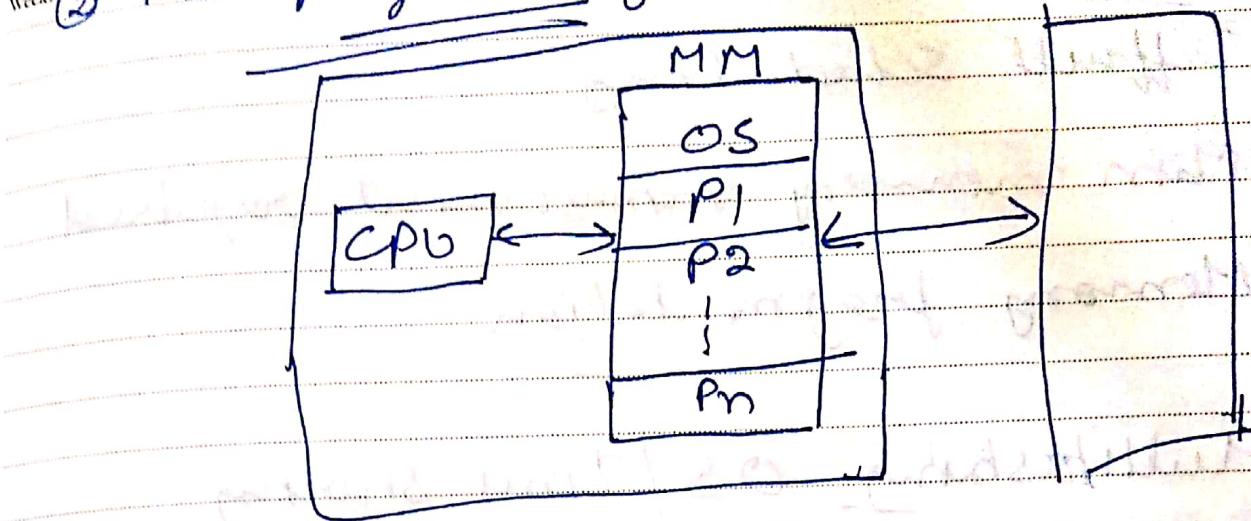
Sunday

- * Jobs with similar needs are batched together and executed through the processor as a group
- * Operator sorts jobs as a set of punch card into ~~sets~~ batch with similar needs.
- * e.g FORTRAN batch, COBAL batch etc.

"Focusing our attention – daily and hourly – not on what is wrong, but on what we love and value, allows us to participate in the birth of a better future, ushered in by the choices we make each and every day." - Carol Pearson

February '14

② Multiprogramming OS:-



- * Maximize CPU utilization
- * Multiprogramming means more than one process in Main Memory which are ready to execute.
- * Process generally require CPU time & I/O time, so if running process perform I/O or some other event which do not require CPU then instead of sitting idle, CPU make a context switch & picks some other process and this idea will continue.
- * CPU never idle unless there is no process ready to execute or at time of context switch

Advantages :-

- ① High CPU utilization
- ② less waiting time
- ③ Nowadays useful when load is more.

MARCH 2014													
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24	25	26	27	28	29	30	31						

11 Tuesday

Disadvantages ↗

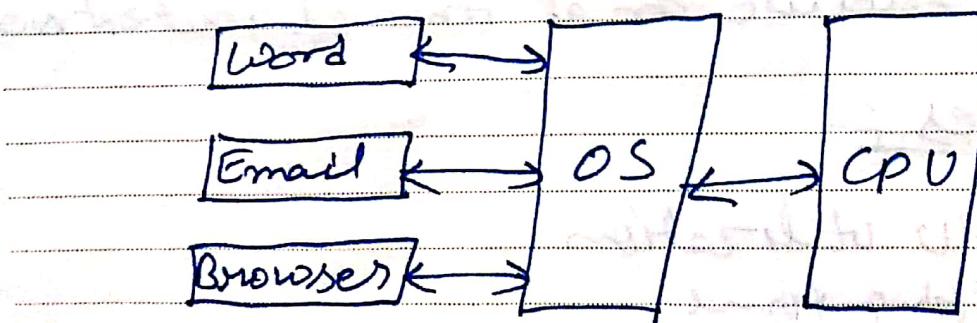
- ① Difficult Scheduling
 - ② Main memory management required.
 - ③ Memory fragmentation.
- ④ Multitasking OS / Time sharing

↗ Multitasking is multiprogramming with time sharing.

↗ One one CPU but switches b/w procs so quickly that it gives an illusion that all executing at the same time.

~~With the fast system~~

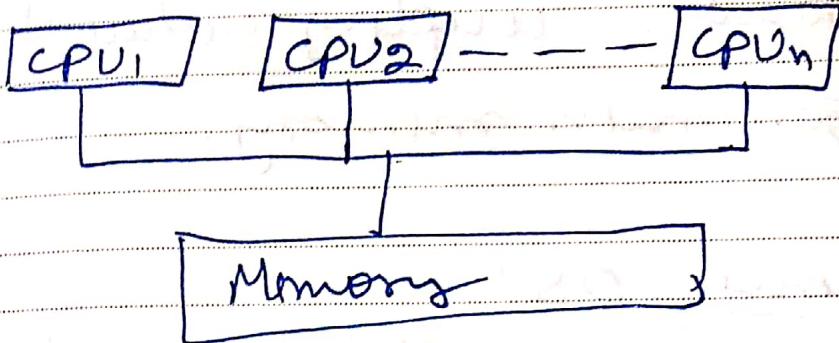
↗ Main idea is better response time and executing multiple procs together



"True courage is not the brutal force of vulgar heroes, but the firm resolve of virtue and reason." - Alfred North Whitehead

February '14

Week: 7
④ Multiprocessing OS:



- * Two or more CPU within a single computer in close communication sharing the system bus, memory & other I/O devices.
- * Different process may run on different CPU, true parallel execution.
- * Symmetric → One OS controls all CPU, each CPU has equal rights.
- * Asymmetric → Master slave arch. - system tasks on one processor and applications on other as one CPU will handle all h/w interrupt or I/O devices, they are easy to design but less efficient.

Advantages

- ① Increased throughput
- ② Increased Reliability
- ③ Cost Saving
- ④ True Parallel Processing.

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12.02

13 Thursday

Disadvantages

- ① More complex
- ② Overhead or coupling reduce throughput
- ③ Large main memory.

⑤ Real Time OS:

Real Time system means that the system is subjected to real time i.e., response should be guaranteed within a specified time constraints or system should meet the specified deadline.

e.g. Flight control system, robots

Types of RTOS:

① Hard real time System:-

Hard real time systems guarantee that critical tasks complete on time. If deadline is missed then the system will fail to work.

② Soft real-time System:

Soft real time systems are less restrictive. If certain deadlines are missed then system continues its working with no failure but its performance degrades. e.g.: multimedia etc.

"If I have been of service, if I have glimpsed more of the nature and essence of ultimate good, if I am inspired to reach wider horizons of thought and action, if I am at peace with myself, it has been a successful day." - Alex Noble

Week: 7 Fuctions of OS:-

① Process management

② Memory management

③ I/O device "

④ File "

⑤ Networks

⑥ Security & Protection

⑦ Process Management:-

O.S is responsible for the following activities w.r.t process management.

→ Creation, deletion, suspension, resumption of process.

→ Managing process synchronization

→ Deadlock handling.

⑧ Main-Memory Mgmt:- O.S is responsible for

→ Allocation & deallocation of memory

→ keep track of used & un-used memory allocation

→ Deciding what process to be loaded into memory.

MARCH 2014											
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15 Saturday

February '14

Week: 7

③ File mgmt: OS is responsible for

→ creation & deletion of files

→ mechanism to protect files.

④ I/O Mgmt:-

⑤ Security & Protection :- Protection involves ensuring that all access to system resources is controlled when several processes execute concurrently, it should not interfere with each other.

Security of system is also important

16 Sunday from outsider. Security requires

user to authenticate himself or herself to the system by means of password.

System Call :-

The purpose of system call is to request the OS to perform some activity. This means that System call provides an interface b/w a process and OS.

"Guard within yourself that treasure, kindness. Know how to give without hesitation, how to lose without regret, how to acquire without meanness." - George Sand

Week: 8

Family Day (Canada), Presidents' Day (USA)

The execution of a system call requires the user process to save its current state, let the OS take the control of the CPU and perform some function. The OS should save its state and give control of the CPU back to the user process.

There are different system calls for performing different kinds of tasks:-

- ① File manipulation System calls are : open, close, read , write etc.
- ② Process control System calls are : abort, execute , create process, terminate a process, allocate & free memory for a process etc.
- ③ Device Mgmt System calls are:- request device, release device , read , write etc.
- ④ Communication:- create/delete comm. connection.
Send/receive message
attach/detach remote devices.

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MARCH 2014

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