

Characteristics/Feature of Operating System

- ❖ User Friendly
- ❖ Multitasking
- ❖ Multi-user Support
- ❖ Fast and Efficient
- ❖ Reliable

- ❖ Secure
- ❖ Portability
- ❖ Automatic Resource allocation
- ❖ Error Handling Capability

The Features of Operating Systems

Providing user interface

- Allows copying/ deleting/ moving/ sorting/ searching of file or folders.
- Allows access to system settings such as hardware.
- Provides a Command Line Interface (CLI).
- Allows users to have more than one window open.
- Provides a Graphical User Interface (GUI) (windows, icons, menus, pointers).
- Provides user with error/help messages.
- Allows customisation of interface, e.g. change desktop background/ layout.
- Allows user to switch between tasks (programs/ windows).

Spooling

- Data is stored on a hard disk/ in memory/ stored in a queue.
- Document is printed when printer is free/ in correct order.
- Benefit of spooling – user can carry on working/log off when waiting for job to print.

Managing RAM

- Ensures that programs/data do not corrupt each other.
- Ensures that all programs and data, including itself, are stored in correct memory locations.

Managing processes

- Ensures that different processes can utilise the CPU and do not interfere with each other or crash.
- Ensures that all tasks appear to run simultaneously on a multi-tasking operating system.

Managing security

- Allows creation and deletion of user accounts.
- Allows users to log on and change passwords.

Managing backing store

- Ensures data is stored and can be retrieved correctly from any disk drive.
- Creates and maintains filing system.
- Organises files in a hierarchical directory structure.

An operating system is a **software** that manages a computer system. The operating system is loaded when a computer starts. One of its primary functions is to **manage resources**.

Disk defragmentation

- Files are stored on computer systems that can, over time, become fragmented. This means they are split and stored on different parts of the disk.
- Defragmentation is the process where files are physically re-arranged on a disk so the parts of each file are stored together.

File compression

- Compression is the process of making a file size smaller.
- This may be advantageous as it allows more data to be stored on the disk, and files may also be transferred more quickly.
- The disadvantage of this is that it slows down the process of reading and writing to disk.

Types of Operating System (OS)

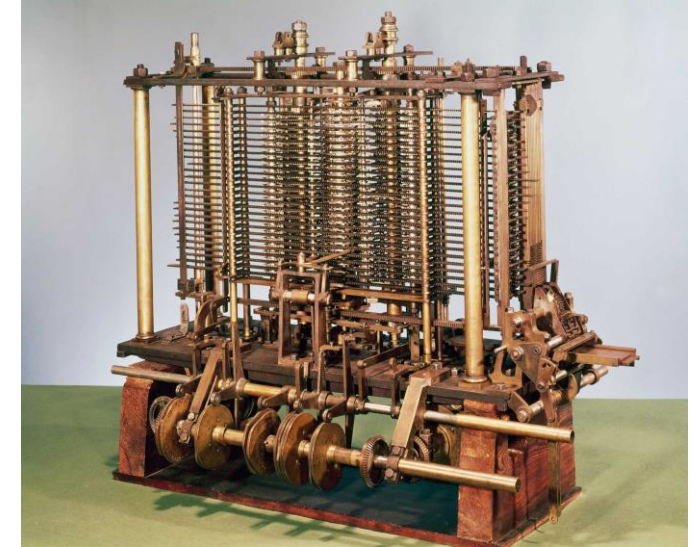
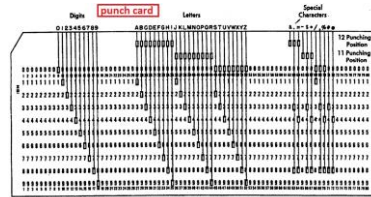
1. Batch OS
2. Multi-Programming OS
3. Multi-Tasking OS / Time Sharing OS
4. Real Time OS – (i) Hard (ii) Soft)
5. Distributed OS
6. Embedded OS
7. Network OS
8. Multi processing OS

1. Batch Operating System

1st Gen
1940 - 1956

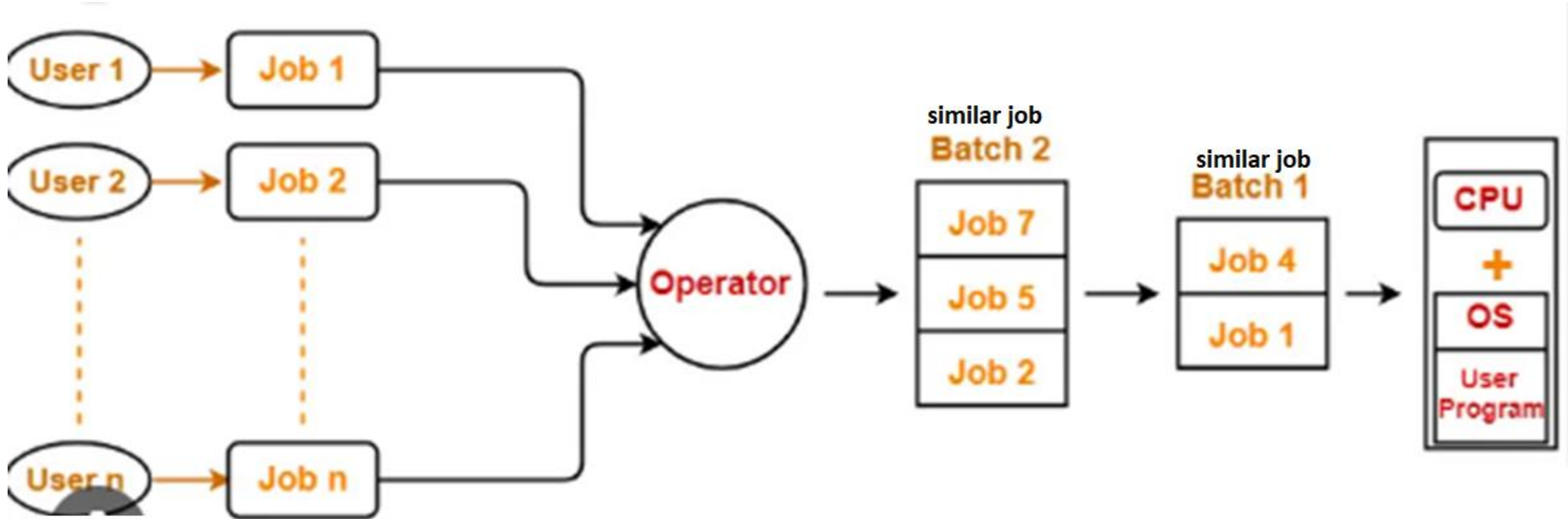
prof. Dhumketu

$$\frac{a \times a + a}{a} = 10, a = ?$$





1. Batch Operating System



Real-life Example

- ❖ Salaries Calculate process in bank/company
- ❖ Result public

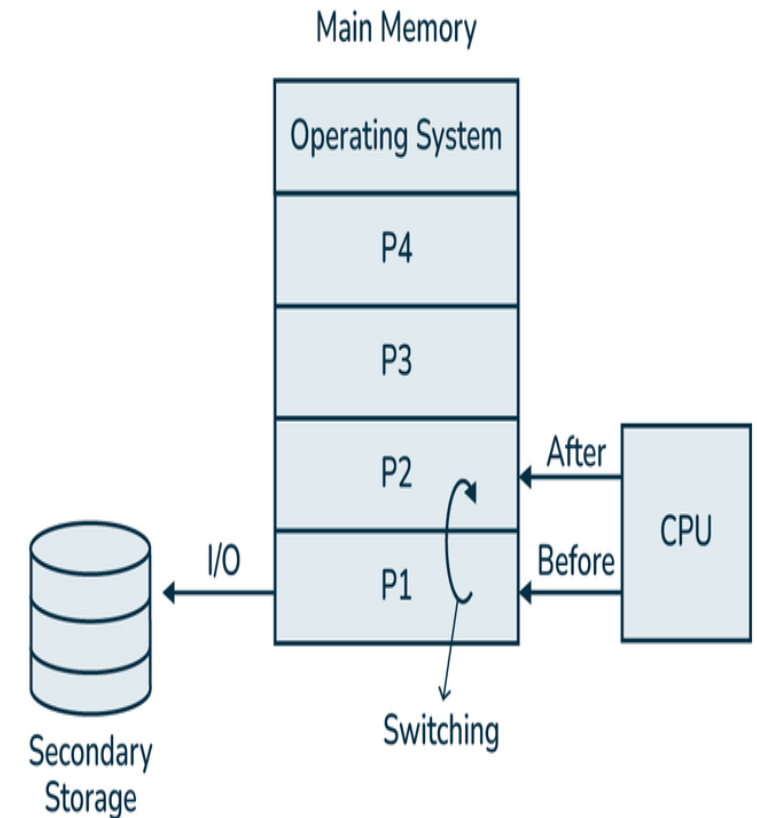
2. Multiprogramming Operating System



2. Multiprogramming Operating System



Application Software



Real-life Example

- ❖ Unix, Windows Server, Linux, IBM OS/360

3. Multitasking Operating System

Timesharing OS



Real-life Example

- ❖ Windows 11/10/7, Mac OS, Linux (Ubuntu, Fedora), Android, IOS

4. Real Time Operating System

Real-time systems are used when there are time requirements that are very strict like missile systems, air traffic control systems, robots, etc

Two Types

i. Hard Real time OS

ii. Soft Real time OS

Real-life Example

- ❖ Airplane Control Systems
- ❖ Medical devices
- ❖ Industrial Robots
- ❖ Traffic light Control system
- ❖ Automobile system
- ❖ Missile/spacecraft guidance





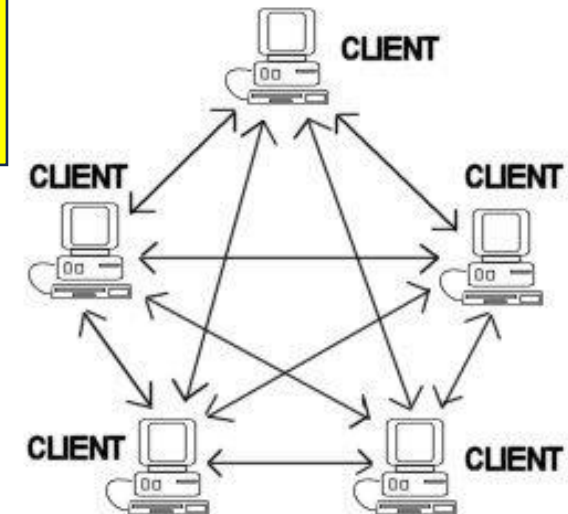
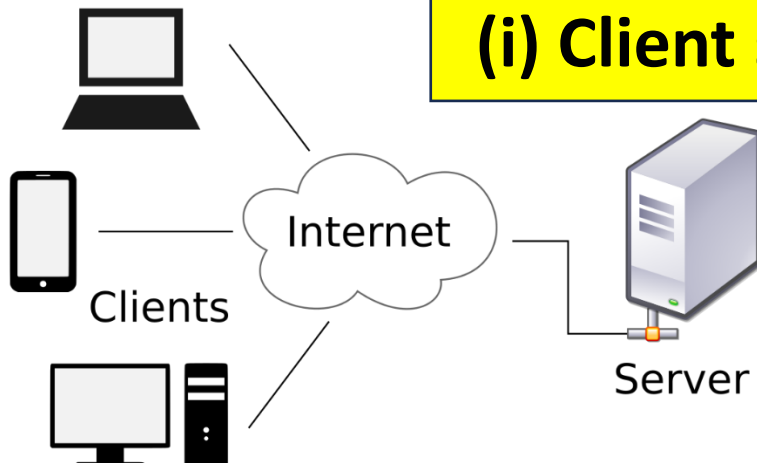


5. Distributed Operating System

Distributed OS manage multiple networked computer and presents them as a single system to the user.

(ऐसा OS जो कई independent computer(node) आपस में network से जुड़े होते हैं, और user को एक ही कंप्यूटर जैसा अनुभव होता है)

Distributed OS – 2 types
(i) Client server base (ii) Peer to Peer





🔍 Search Google or type a URL

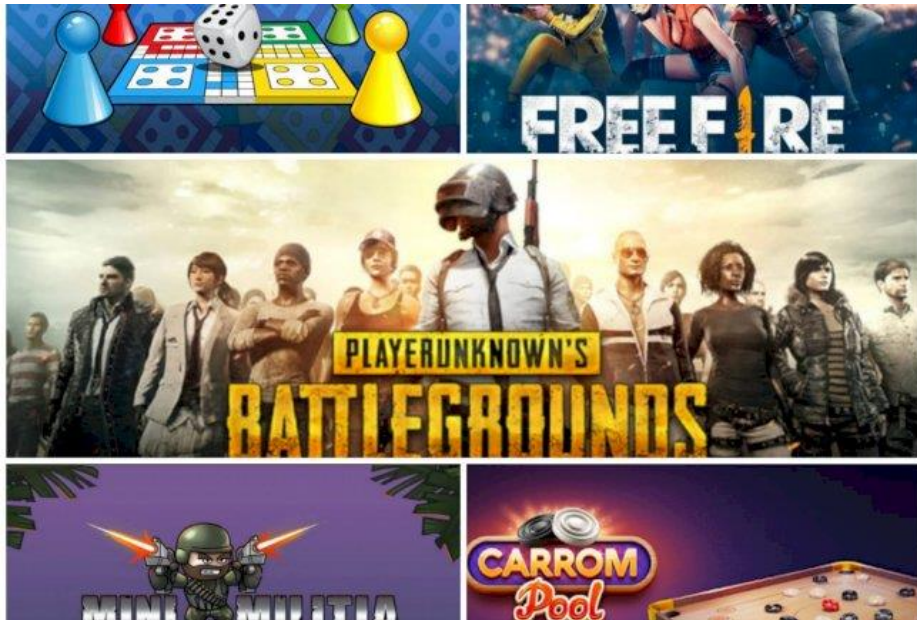


Client server Example

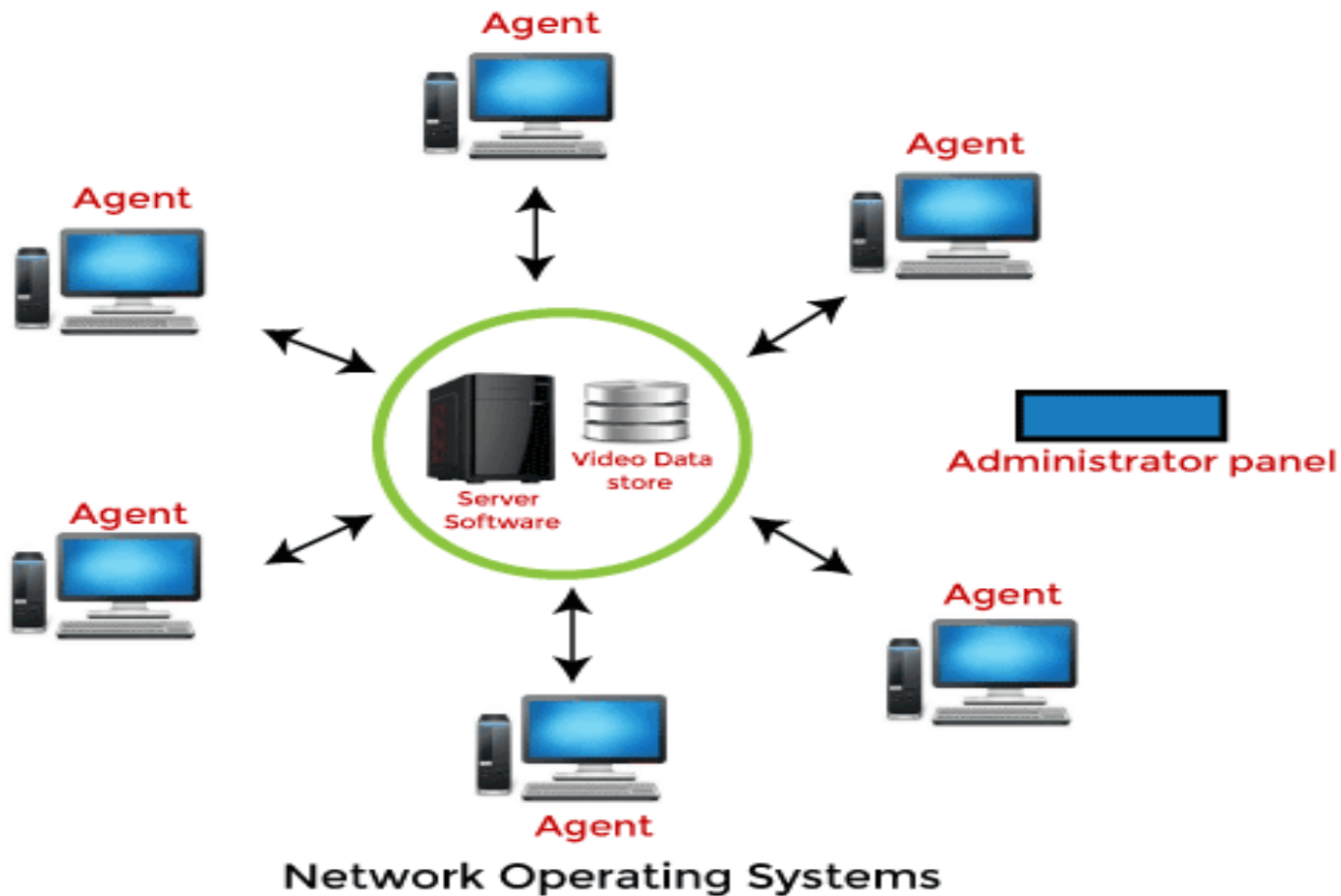
- Vacancy form fill (SSC, UPSC, railway,...)
- Railway ticket booking
- Online banking
- Aadhar
- College admission
- Online shopping
- Online result
- Youtube/Netflix/facebook/...

Peer to Peer

- Bluetooth file sharing
- File sharing in LAN



6. Network Operating System



Real-life Example

- ❖ Linux server
- ❖ Windows Server

7.Embedded Operating System



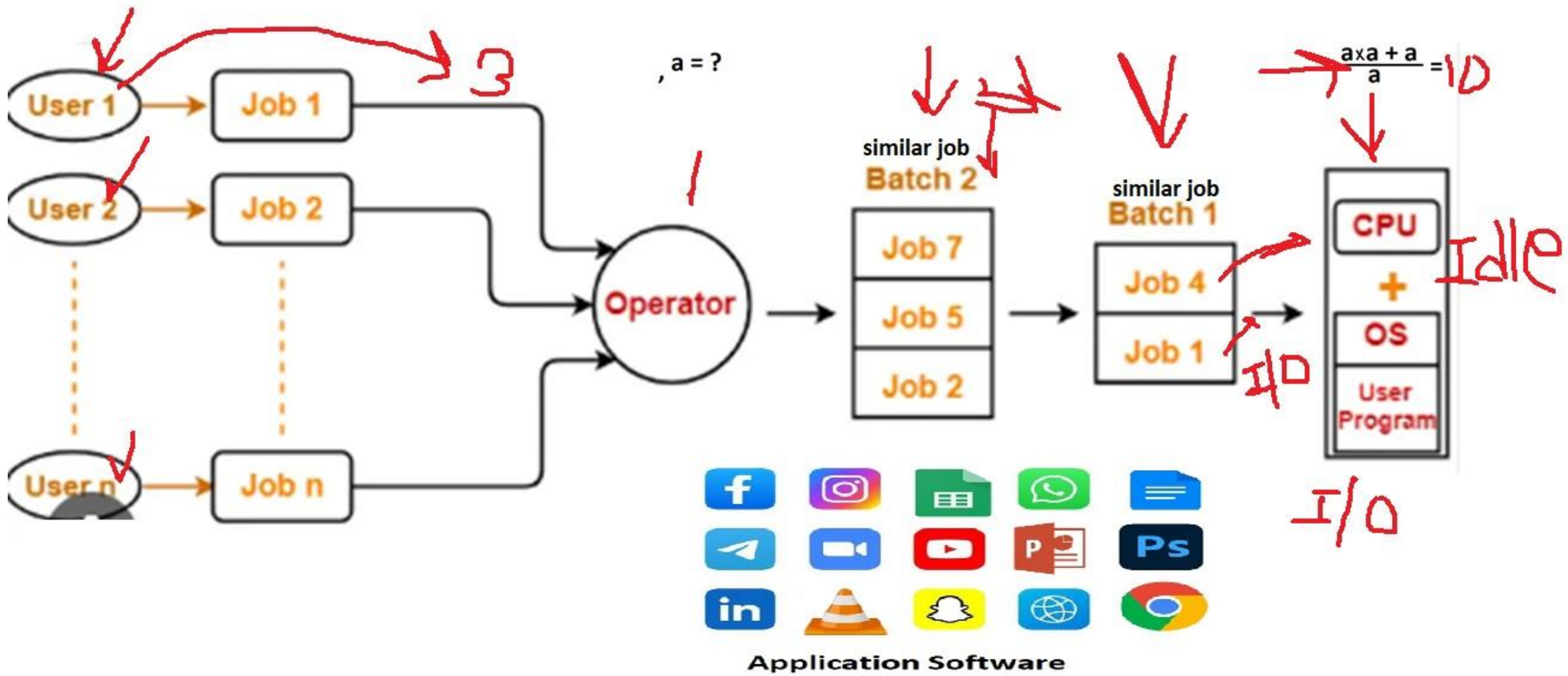
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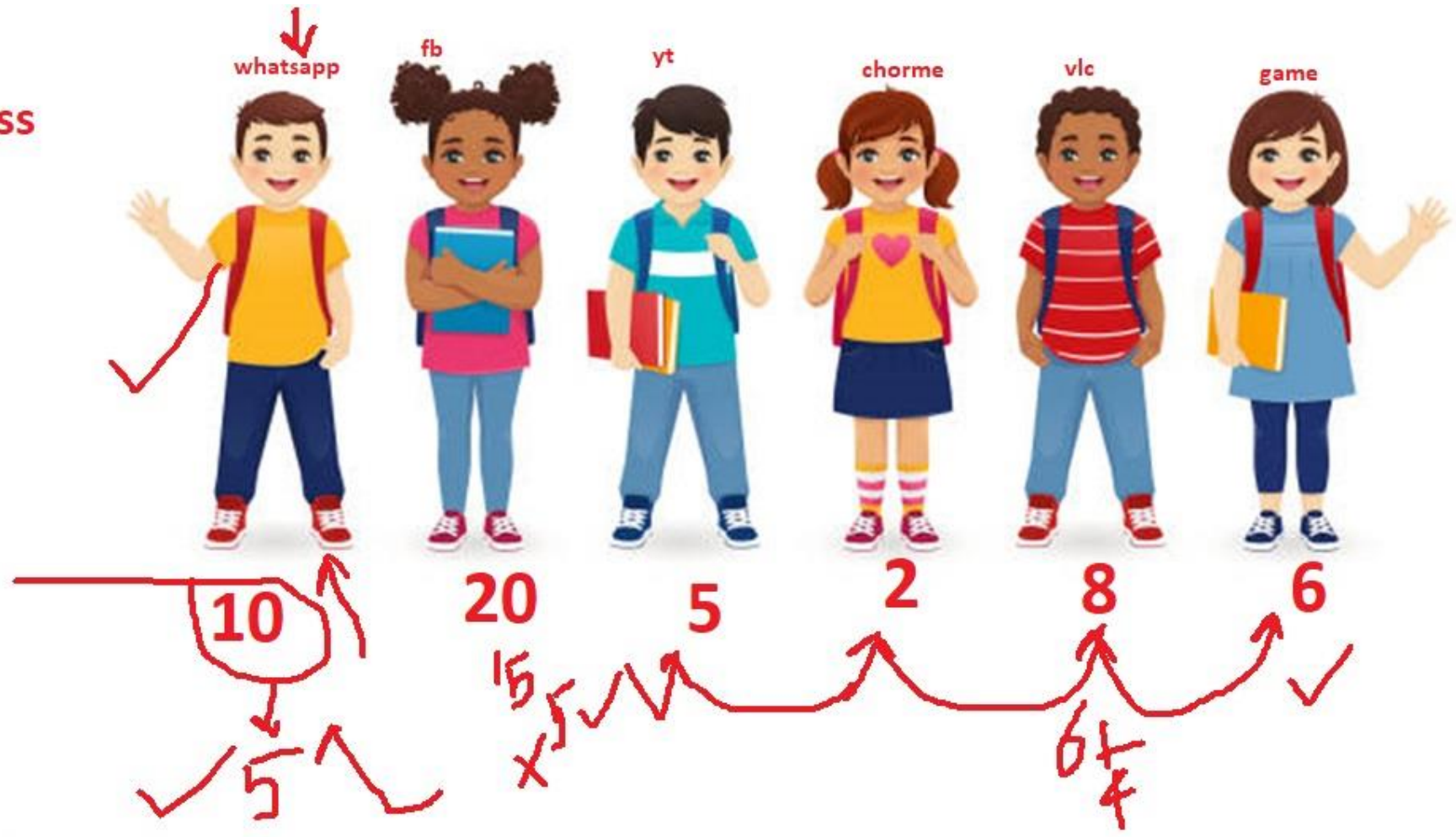
batch 3

Batch	Time	Temp	Humidity	Pressure	Speed	Quality
1	10:00	25	60	1013	1200	95
1	10:10	26	61	1012	1250	96
1	10:20	27	62	1011	1300	97
1	10:30	28	63	1010	1350	98
1	10:40	29	64	1009	1400	99
1	10:50	30	65	1008	1450	100
1	11:00	31	66	1007	1500	100
1	11:10	32	67	1006	1550	100
1	11:20	33	68	1005	1600	100
1	11:30	34	69	1004	1650	100
1	11:40	35	70	1003	1700	100
1	11:50	36	71	1002	1750	100
1	12:00	37	72	1001	1800	100
1	12:10	38	73	1000	1850	100
1	12:20	39	74	999	1900	100
1	12:30	40	75	998	1950	100
1	12:40	41	76	997	2000	100
1	12:50	42	77	996	2050	100
1	13:00	43	78	995	2100	100
1	13:10	44	79	994	2150	100
1	13:20	45	80	993	2200	100
1	13:30	46	81	992	2250	100
1	13:40	47	82	991	2300	100
1	13:50	48	83	990	2350	100
1	14:00	49	84	989	2400	100
1	14:10	50	85	988	2450	100
1	14:20	51	86	987	2500	100
1	14:30	52	87	986	2550	100
1	14:40	53	88	985	2600	100
1	14:50	54	89	984	2650	100
1	15:00	55	90	983	2700	100
1	15:10	56	91	982	2750	100
1	15:20	57	92	981	2800	100
1	15:30	58	93	980	2850	100
1	15:40	59	94	979	2900	100
1	15:50	60	95	978	2950	100
1	16:00	61	96	977	3000	100
1	16:10	62	97	976	3050	100
1	16:20	63	98	975	3100	100
1	16:30	64	99	974	3150	100
1	16:40	65	100	973	3200	100
1	16:50	66	101	972	3250	100
1	17:00	67	102	971	3300	100
1	17:10	68	103	970	3350	100
1	17:20	69	104	969	3400	100
1	17:30	70	105	968	3450	100
1	17:40	71	106	967	3500	100
1	17:50	72	107	966	3550	100
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1	22:50	102	137	936	5050	100
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1	26:00	121	156	917	6000	100
1	26:10	122	157	916	6050	100
1	26:20	123	158	915	6100	100
1	26:30	124	159	914	6150	100
1	26:40	125	160	913	6200	100
1	26:50	126	161	912	6250	100
1	27:00	127	162	911	6300	100
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1	27:40	131	166	907	6500	100
1	27:50	132	167	906	6550	100
1	28:00	133	168	905	6600	100
1	28:10	134	169	904	6650	100
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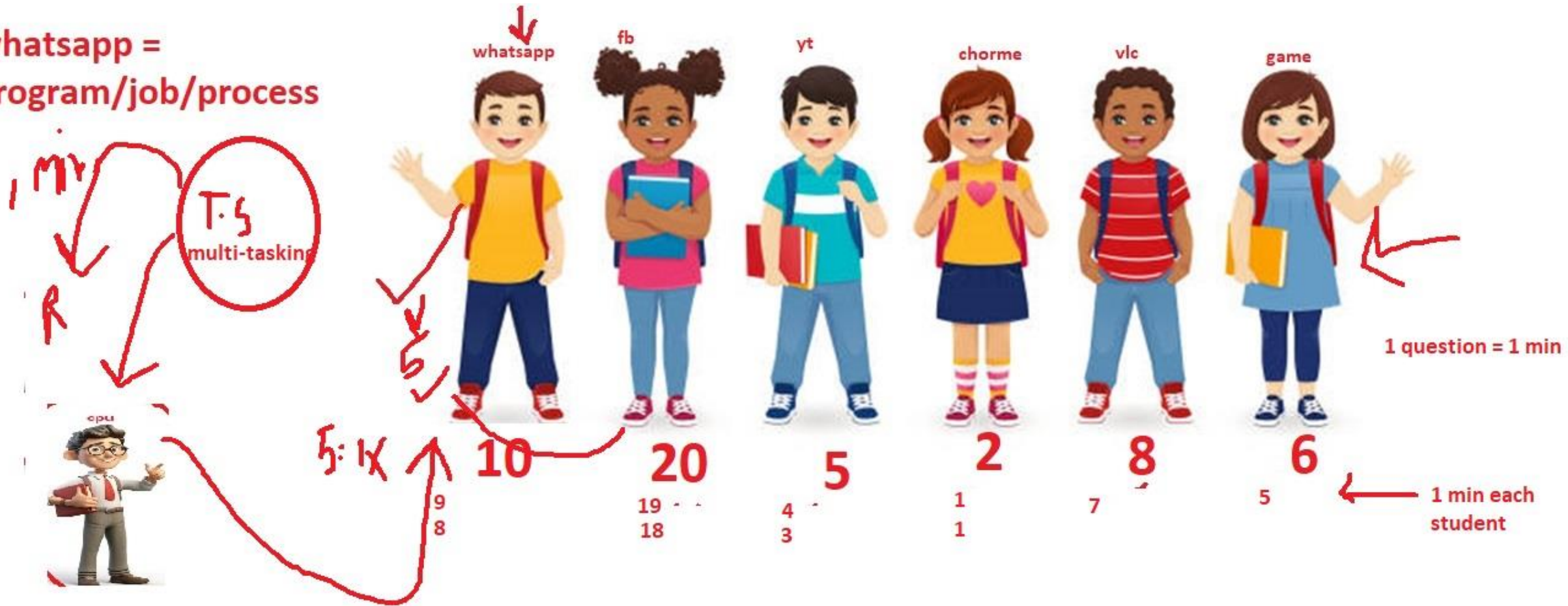


whatsapp =
program/job/process

multi-
programming



whatsapp =
program/job/process



Multi-tasking / Time sharing OS

Multiprocess OS



Whatsapp



Youtube



VLC player



video call