EVOLUTION OF OS

1 The First Generation : (1945-55) Vacuum Tubes

- No operating system.
- Vacuum Tubes were used for computing.
- A single group of people (usually engineers) designed, built, programmed, operated, and maintained each machine.
- All programming was done in absolute machine language, or even worse yet, by wiring up electrical circuits by connecting thousands of cables to plugboards to control the machine's basic functions.
- The usual mode of operation was for the programmer to sign up for a block of time using the signup sheet on the wall, then come down to the machine room, insert his or her plugboard into the computer, and spend the next few hours hoping that none of the 20,000 or so vacuum tubes would burn out during the run.
- By the early 1950s, the routine had improved somewhat with the introduction of punched cards. It was now possible to write programs on cards and read them in instead of using plugboards;

The Second Generation : (1955-65) Transistors and Batch Systems

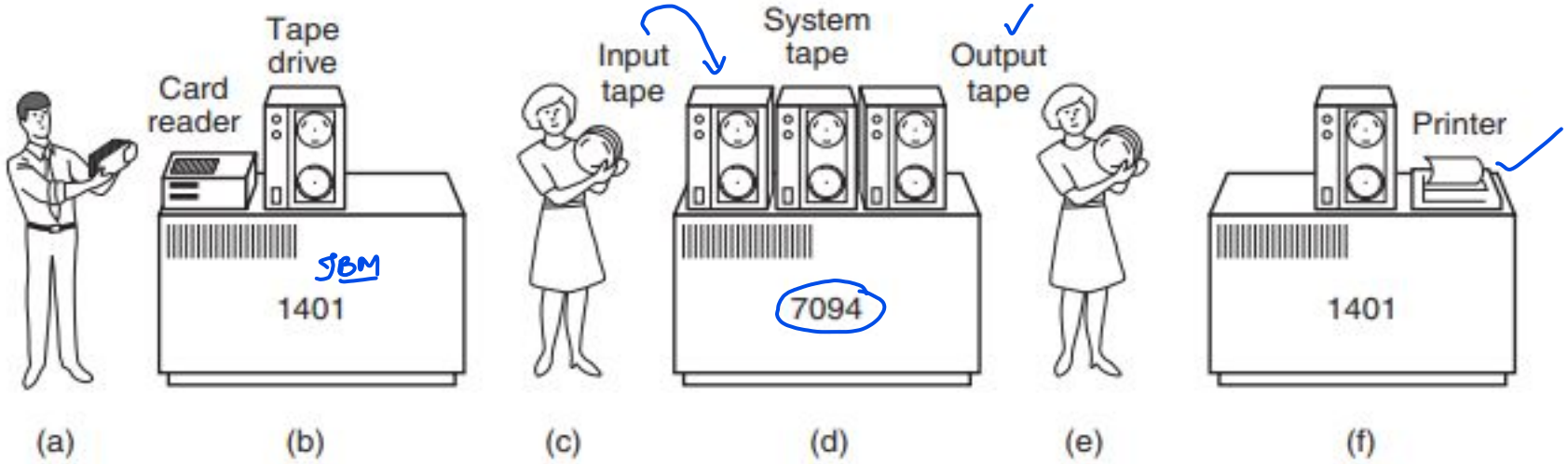

Figure 1-3. An early batch system. (a) Programmers bring cards to 1401. (b) 1401 reads batch of jobs onto tape. (c) Operator carries input tape to 7094. (d) 7094 does computing. (e) Operator carries output tape to 1401. (f) 1401 prints output.

Second Generation Continued....

1. After about an hour of collecting a batch of jobs, the cards were read onto a magnetic tape, which was carried into the machine room, where it was mounted on a tape drive.
2. The operator then loaded a special program (the ancestor of today's operating system), which read the first job from tape and ran it.
3. The output was written onto a second tape, instead of being printed. After each job finished, the operating system automatically read the next job from the tape and began running it.
4. When the whole batch was done, the operator removed the input and output tapes, replaced the input tape with the next batch, and brought the output tape to a 1401 for printing off line

The Third Generation : (1965-80) IC's & Multiprogramming

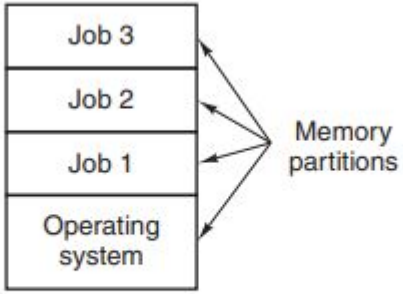

Figure 1-5. A multiprogramming system with three jobs in memory.

- ability to read jobs from cards onto the disk as soon as they were brought to the computer room.
- Then, whenever a running job finished, the operating system could load a new job from the disk into the now-empty partition and run it. This technique is called spooling.
- The Time-Sharing OS provides computer resources to numerous programs simultaneously in a time-dependent manner. As a result, it aids in providing direct access to the main computer to a large number of users.

The Fourth Generation : (1980-Present) Personal Computers

- With the development of LSI (Large Scale Integration) circuits—chips containing thousands of transistors on a square centimeter of silicon were used.
- The concept of personal computers is similar to the minicomputer that was introduced in the third generation.
- The birth of the Microsoft Windows operating system was in 1975 and then Bill gates took the personal computers to next level by launching MS-DOS in 1981, but due to the cryptic commands, it was difficult for a user to get hold of the commands.
- In this generation, people were also introduced to Graphic User Interface(GUI).
- Today, Windows is the most popular operating system and has evolved from Windows 95, Windows 98, Windows XP, and Windows 7. The most used Windows operating system was Windows 7 and Windows 10.
- In 2021, Windows 11 was introduced with major changes. Apple also introduced its operating system known as MacOS which is also as popular as Windows these days.

The Fifth Generation : (1990-Present) Mobile Computers

- The first true handheld phone appeared in the 1970s and, at roughly one kilogram, was positively featherweight.
- 1995 - Nokia released the N9000, which literally combined two, mostly separate devices: a phone and a PDA (Personal Digital Assistant)
- Symbian OS. It was the operating system of choice for popular brands like Samsung, Sony Ericsson, Motorola, and especially Nokia.
- other operating systems like RIM's Blackberry OS (introduced for smartphones in 2002) and Apple's iOS (released for the first iPhone in 2007)
- For phone manufacturers, Android had the advantage that it was open source and available under a permissive license. As a result, they could tinker with it and adapt it to their own hardware with ease.

Java

Generation	Year	Electronic devices used	Types of OS and devices
First	1945 – 55	Vacuum tubes	Plug boards
Second	1955 – 1965	Transistors	Batch system
Third	1965 – 1980	Integrated Circuit (IC)	Multiprogramming
Fourth	Since 1980	Large scale integration	PC