

**SOS POLITICAL SCIENCE AND
PUBLIC ADMINISTRATION**

MBA FA 401

**SUBJECT NAME: COMPUTER
APPLICATIONS IN FINANCIAL
ADMINITRATION**

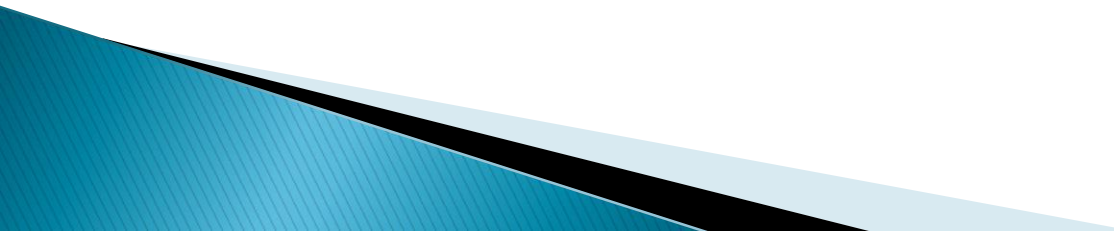
TOPIC NAME: RANDOM ACCESS MEMORY



- ▶ Random-access memory (RAM) is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code. A random-access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory. In contrast, with other direct-access data storage media such as hard disks, CD-RWs, DVD-RWs and the older magnetic tapes and drum memory, the time required to read and write data items varies significantly depending on their physical locations on the recording medium, due to mechanical limitations such as media rotation speeds and arm movement.
- ▶ RAM contains multiplexing and demultiplexing circuitry, to connect the data lines to the addressed storage for reading or writing the entry. Usually more than one bit of storage is accessed by the same address, and RAM devices often have multiple data lines and are said to be "8-bit" or "16-bit", etc. devices.

- ▶ In today's technology, random-access memory takes the form of integrated circuit (IC) chips with MOS (metal-oxide-semiconductor) memory cells. RAM is normally associated with volatile types of memory (such as dynamic random-access memory (DRAM) modules), where stored information is lost if power is removed, although non-volatile RAM has also been developed. Other types of non-volatile memories exist that allow random access for read operations, but either do not allow write operations or have other kinds of limitations on them. These include most types of ROM and a type of flash memory called NOR-Flash.

FEATURES OF RAM:

- ▶ It is used very commonly.
 - ▶ RAM is packaged as a chip.
 - ▶ Basic storage unit is a cell(one bit per cell).
 - ▶ Multiple RAM chips form a memory.
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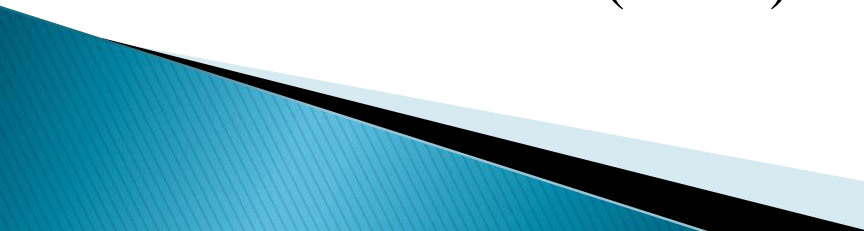
USES OF RAM:

- ▶ The purpose of RAM is to provide quick read and write access to a storage device. The computer uses it to load data since it is much faster than running that data from a hard drive.
- ▶ A clear analogy to understand the use that is given to RAM is to think of this memory as an office desk. It stores the important documents and writing tools that will be needed continuously are on it.
- ▶ Will keep all the documents and other items stored in files, which would cause us to take more time to access the documents or make use of other frequently used tools.
- ▶ All the data that we are actively using in our computer (or Smartphone, Tablet, etc.) is stored temporarily in RAM.
- ▶ The Random Access Memory has read and write times much faster than a hard disk. And this is due to the physical limitations of a hard disk, such as the speed of rotation of a disk.

TYPES OF RAM:

- ▶ Dynamic RAM (DRAM)
- ▶ Static RAM (SRAM)

DYNAMIC RAM(DRAM):

- ▶ DRAM is a type of RAM that stores each bit of data on a separate capacitor. This is an efficient way to store data in memory, because it requires less physical space to store the same amount of data than if it was stored statically.
 - ▶ DRAM is the most common type of memory found in personal computer systems.
 - ▶ Dynamic random-access memory (DRAM) is a type of random access semiconductor memory that stores each bit of data in a memory cell consisting of a tiny capacitor and a transistor, both typically based on metal-oxide-semiconductor (MOS) technology.
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STATIC RAM (SRAM):

- ▶ Static random-access memory is a type of semiconductor random-access memory that uses bi-stable latching circuitry to store each bit. SRAM exhibits data remanence, but it is still volatile in the conventional sense that data is eventually lost when the memory is not powered.
- ▶ SRAM stores a bit of data on four transistors using two cross-coupled inverters. The two stable states characterize 0 and 1. During read and write operations another two access transistors are used to manage the availability to a memory cell. To store one memory bit it requires six metal-oxide-semiconductor field-effect transistors (6T1M1). 6T1M1 is one of the two types of SRAM chips; the other is the bipolar junction transistor. The bipolar junction transistor is very fast but consumes a lot of energy. 6T1M1 is a popular SRAM type.

DIFFERENCE BETWEEN SRAM & DRAM:

| SRAM | DRAM |
|--|--|
| A type of semiconductor memory that uses bi-stable latching circuitry(flip flop) to store each bit. | A type of random access semiconductor memory that stores each bit of data in a separate tiny capacitor within an integrated circuit. |
| Stands for static random access memory. | Stands for dynamic random access memory. |
| Very fast. | Not as fast as SRAM. |
| Does not require refresh cycles to retain data. | Requires periodical refresh cycles to retain data |
| Requires refreshing, it has more complex circuitry and timing requirements. | Not as complex as SRAM. |

SOME OTHER DIFFERENCES:

| SRAM | DRAM |
|--------------------------------------|---|
| Used for CPU cache. | Used for the computer's main memory. |
| Require minimum time to access data. | Requires more time to access data. |
| Complex structure – has flip flops. | Simple structure- has a translator and a capacitor. |
| Has a lower density. | Has a higher density. |
| Expensive. | Less expensive. |