

LESSON PLAN**IT**

Name of school	'Remus Radulet' Technical College, Brasov
Level	upper intermediate/advanced
Area	IT
Time	50 min.
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COMPUTER MEMORY

STARTER

Answer the following questions about the computer memory:

1. What do you know about information storage?
2. How many types of memories are there?

MATCHING

Match the two words with the dictionary definitions provided: RAM, ROM.

.....computes random access memory; it is the part of a computer that programs are loaded into while the computer is being used and where information can be saved and changed.

.....computes read-only memory; it is a type of computer memory that is permanent and cannot be changed.

READING

A. Read the text and decide if the following sentences are true or false. Correct them where necessary.

1. In sequential access words are accessed randomly.
2. Fifo memories are used in semiconductor products as micro-processors and microcontrollers.
3. In random access memory information is stored in a long string.
4. Audio and video cassette tapes use sequential access memories.
5. Random access means that you are not free to choose any data location next.
6. Fifo method can be compared to people standing in a queue.

B. Now answer the following questions:

1. What methods can you use to access information from a storage system?
2. What happens when you want to access a piece of information by the sequential access method?
3. Explain the functioning of Lifo and Fifo memories and point out the main differences.
4. What kind of semiconductor products makes use of these memories?

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LIFO and FIFO memories

RAM stands for Random Access Memory, but the term RAM has become a noun meaning volatile memory. Back in time, when RAM was an acronym, it referred to the means of locating particular data in a storage system. Information can be accessed using one of the following methods:

- random access
- sequential access
- First-In-First-Out (FIFO)
- Last-In-First-Out LIFO)

Random access means that any data location can be selected and accessed next; you are free to choose any location.. Words are accessed randomly. All the other access methods are not random. Random access is specific for semiconductor memories but this is not the only access method used as there are semiconductor memories with non-random access.

In **sequential access** memory architectures information is stored in a long string. When you want to access some part of that string you have to "travel" through whatever data is placed between where you are starting and where you want to go. Audio and video cassette tapes are good examples of this type of storage.

Another access method is **FIFO** (First-In-First-Out). This storage architecture can be imagined of as a queue where the information is available in the same order as it was introduced into the memory. Looking at a line of people patiently waiting for their turn to pay the goods they selected to buy, you will see that the first in the queue is the first one out, the second one into the line is the second one out, and so on. The FIFO method is widely used in semiconductor products in storage blocks such as shift registers or in serial data communication.

To understand how Last-In-First-Out, or **LIFO** memory works imagine you have a can with tennis balls. You put the balls in the can and then you get them out; the last one placed in the can being the first one that gets out, the second last being the second you can get out and finally, the first one placed in the can being the last one you can get out. The order in which you can "access" the balls is the reverse order in which the balls have been placed in the can.

In semiconductors, LIFO memories are used as a block in microprocessors and microcontrollers. Its most common function is to store the address of some step in a series of instructions when that series is interrupted and called upon to perform some other, more urgent, task (task 1). If in turn, that routine is also interrupted in its course (by task 2), then the "stopped at" instruction address is placed on the stack on the top of the first one. Once the more urgent task (task 2) is completed, the system returns to the stack to find the address of the step in the interrupted routine; the system will find the address on the top of the stack, the last one stored. The last address that was stored (In) is retrieved (Out) and so the machine can continue now task 1 from where it left off. When task 1 is completed, the system returns again to the stack and retrieves the address of the instruction to be executed when the first interruption occurred.

(Gerigan, Carmen: Measurement of Electronic Devices and Circuits)

- a) In a perfect universe the capacitor would store data indefinitely.
- b) Video cassette manufacturers use this type of information storage.
- c) We have recommended the study of semiconductor products.
- d) The system has retrieved the address.
- e) The memory reads an entire row.
- f) The following figure shows the clock signal.

DISCUSSION AND DEBATE

Compare the human brain to the computer memory

Work in pairs or threes. Make a list of ideas related to the topic that are presented in your group.

Then compare your opinions with those of the rest of the class.

Key:

Matching:

1 - RAM: 2 - ROM

Reading:

A. 1 - F; 2 - T; 3- F: 4- T; 5- F; 6- T

B. 1 - random access, sequential access, FIFO and LIFO

2 - You have to reach your destination by travelling through the data that are between where you are and your destination

3 - FIFO operates as a queue, with the information available in the same order as it was introduced; LIFO works as a tennis ball can where the information is obtained in reverse order

4 - FIFO - in shift registers and serial data communication; LIFO - in microprocessors and microcontrollers

The passive

Information can be accessed; any data location can be selected and accessed; are accessed randomly; information is stored in a long string; this storage architecture can be thought of, etc

- a. In a perfect universe data would be stored indefinitely by the capacitor.
- b. This type of information storage is used by videocassette manufacturers.
- c. The study of semiconductor products has been recommended.
- d. The address has been retrieved by the system.
- e. AN entire row is read by the memory.
- f. The clock figure is shown in the following figure.