This is a test!!!!!!!

COMPUTER MEMORY

By: Your Name Goes Here ✍

A digital computer memory is the component of a computer system that provides storage for the computer program **instructions** and for data. The **internal**, or primary, memory is an essential feature of computers. Many computer operations involve reading instructions from memory and executing them by reading data from memory, performing an operation, and writing results back into memory. Because there is room to store only a limited amount of *information* in the primary memory of a computer, permanent storage of large amounts of *information* must be accommodated by external, or secondary, memories such as magnetic tapes.

Structure

A primary memory component consists of many storage locations, each of which is uniquely identified by an address. An address is a number, just as a street address is a number that identifies a house or building. To read from memory, the address of the desired information must be supplied to the memory along with a command to "read." The content of the specified location is then produced as output. To write into memory, the address of the location and the information to be written must be supplied to the memory along with a "write" *command*. Thus a memory component has as subcomponents: storage locations, an addressing structure that can uniquely select locations, data paths for

moving information into and out of storage, and the control logic necessary to interpret commands.

Each read or write operation is called an access. Sequential access memories, such as magnetic disks or tape, are usually used for secondary storage. In order to move from one address to another in such memories, it is necessary to proceed sequentially through all locations *between* the two addresses--for example, by winding a tape. In random access memories (RAMs), on the other hand, all locations can be accessed directly by electronic switching. RAMs are used in primary memories because they are much faster than sequential access memories.

Memory units that are frequently read from but seldom or never written into, such as the control programs in hand calculators are known as read-only memories (ROMs). ROMs have permanent information placed in them during manufacture. Programmable ROMs (PROMs) may be manufactured as standard units and then have permanent information implanted in them--for example, by a pattern of electrical signals. Erasable programmable ROMs (EPROMs), on the other hand, may have new information implanted in them from time to time by the user.

Properties. The size of a computer memory refers to the amount of information that may be stored; the smallest unit of information in digital computer systems is the bit, or binary digit, a unit with one of two values, 0 or 1, used in the BINARY NUMBER system. An addressable unit is the group of bits that constitute the information in an addressable storage location. Common sizes for the addressable unit are 8, 16, 32, and 64 bits. The memory size is specified by the addressable unit size and by the number of addresses.

Modern computers have from 64,000 to more than 4 billion addressable locations. New designs are increasing these numbers.

The rate of information transfer between the central processing unit and memory is determined by the memory cycle time and the path width, or number of bits moved in each cycle. Memory cycle time is the time required by the memory system to carry out a read or write operation. Cycle times have declined steadily since the introduction of random access memories (c.1950), and this trend is continuing. Current computers have memory cycle times ranging from 1 microsecond (one-millionth of a second) down to 0.05 microseconds.

Types

Until the 1970s most large primary memories used ferrite cores—rings of magnetized material about a millimeter in diameter, strung like beads on a wire grid. The direction of magnetization of each core in the memory determines the binary value it carries. Ferrite-core memories are "nonvolatile"; that is, they retain their store of information even after power has been removed from the system.

Most primary memories now are made up of small integrated circuit chips, each of which, in the present state of technology, can hold about 64,000 bits of information. The information is stored electrically in arrays of tiny semiconductor capacitors, which can be either uncharged or charged, corresponding to binary values of 0 and 1. Such memories are "volatile"--their information is lost when power is removed, although standby battery power can be used to overcome this deficiency. Semiconductor memories have rapidly replaced ferrite cores because of their great advantages in terms of speed, density of

storage, power consumption, and cost. Rapid advances are still occurring in all of these areas. The next generation of RAMs may incorporate superconductive tunnel junctions. These devices exploit the extremely low electrical resistance of certain semiconductors at temperatures near absolute zero to increase switching speed and cut power consumption. They may operate at speeds 10 to 100 times faster than present memories.

Performance Improvement

Several design methods are available to improve primary memory performance. One technique is called interleaved memory. If two memory modules are built, and each can be accessed independently to provide instructions and data to the central processing unit, then a potential exists for transferring twice as much information in a given time. The potential is not reached in a realistic sense, but the idea is used to best advantage when odd memory addresses are placed in one module and even addresses in the other. Thus the name interleave refers to address interleaving. A second performance improvement method is the insertion of a higher performance, small memory between the primary memory and the central processing unit. This memory, called a buffer or cache, can be used in a dynamic way to hold frequently referenced instructions or data. This reduces the number of slower primary memory accesses.

Title of the document

Directions: Your boss has given you this rough draft of a document that he needs to have published and sent out to the shareholders of your company to explain the intricacies of programming software. He has given you the following specifications.

1. Use your own font and size (nothing to small or too large please, and it must contain both small and capital letters, this is to be professional). Be sure to JUSTIFY the paragraphs

2. Use **BOLD** and *ITALICIZING* and colored text in the places you think it needs it.

3. Use a couple DROP CAPS in places you think it would be useful. Set them to a different font, color and number, as well as the number of lines you wish them to be dropped.

4. Use a minimum of two COLOMNS where you think they would look good. In one column you need a drop cap and graphic. In one you need it left or right formatted, as well as line between them.

5. Insert some PICTURES. Set some to “tight” and some to ”square. “ A minimum of two pictures need to be from the clipart, and two need to be Internet graphics. You will need to find the graphics on your own, and they should in some way be related to computer programming.

6. Put BORDERS around the pictures you inserted in the border style you want. Put a background color behind at least one graphic

7. Put a border around a paragraph and shade the contents of the paragraph to a color of your choice.

8. Insert a “cartoon text balloon.” Shade it in with a color and put some text inside it.

9. Use the HIGHLIGHTER PEN function.

10. Put headers and footers on the document pages with the exception of page one.

11. Format the document in any other ways you see fit to do so to make it look NICE.