Brief comparison of storage devices

All data, files, and information is stored using the binary system, which is a number system based on 1’s and 0’s. Every thing in a computer is stored in a sequence of 1’s and 0’s, and a single 1 or 0 is called a bit. The following table is then useful:

1 byte = 8 bits
1 kilobyte = 1024 bytes = 8,192 bits
1 megabyte = 1,024 Kbytes = 1,048,576 bytes = 8,388,608 bits
1 gigabyte = 1,024 Mbytes = 1,048,576 Kbytes = 1,073,741,824 bytes
1 terabyte = 1,024 Gbytes = 1,048,576 Mbytes = 1,073,741,824 Kbytes = 1,099,511,627,776 bytes

1 byte of memory can normally hold one of the following:
- a single alphabetical letter (upper or lower case)
- a single number 0-9
- a symbol, such as +, -, £, #, >, @, etc
- and 127 alternative characters, such as letters in foreign languages, lines, or Greek symbols

Now if a single byte then corresponds to any single character, then the extreme size of storage can then possibly be grasped. To put this all in perspective, lets take a look at a book that every one has at least heard of, the bible. The bible has 3,566,480 letters; this only counts alphabetic characters, not the punctuation or numbers. We then have the following relation:

1 letter = 1 byte
3,566,480 letters = 3,566,480 bytes = 3,483 Kbytes = 3.4 Mbytes

If all characters are considered then the bible would use 4.8 Mbytes. Using this as the size of the bible, we can then see the number of bibles that could be stored in different storage devices, with the maximum storage capacity given for each one also.

1) 8 inch floppies
   160 Kbytes = 0.032 bibles

2) 5 ¼ inch floppies
   360 Kbytes = 0.073 bibles
   720 Kbytes = 0.146 bibles

3) 3 ½ inch floppies
   1.4 Mbytes = 0.292 bibles

4) Zip drives
   200 Mbytes = 41.66 bibles

5) Recordable CD
   700 Mbytes = 148.83 bibles

6) Recordable DVD
   4.7 Gbytes = 1,002.67 bibles

7) memory stick
   512 Mbytes = 106.66 bibles

8) hard drive
   1 Gbyte = 213.33 bibles
   80 Gbytes = 17,066.66 bibles

How big is 17,066? If we let a bible be 10 inches long, 7 inches wide and 2 inches high and have a room that is 25 feet by 25 feet; we could place the bibles end to end and fill the room to a height of well over 2 feet tall ( actually 28 inches )!! That is amazing!