

**Problem 1**

Request	Solution
120 KB + 120 KB =	245,760 (bits)
200 KB + 1024 byte =	201 (KB)
100 MB + 1000 KB + 1 GB =	1,151,976 (KB)
120 KB + 120 KB =	30720 (bytes)
128 byte + 1020 B =	1.12109375(KB)

**Problem 2**

A book has on average 2500 characters per page. We know that a character is stored in one byte. How many book pages fit on a floppy disk 1440 KB? But on a 700 MB CD? But on a 4GB DVD?

**Solution:**

A page is stored on  $2,500 * 8$  bytes = 2,500 bytes. A diskette has 1,440KB =  $1,440 * 1,000$  bytes = 1,440,000 bytes. So a floppy disk can store  $1,440,000 / 2,500$  bytes/page = 576 pages.

A CD has 700MB =  $700 * 1,000 * 1,000$  bytes = 700,000,000 bytes. So a CD can store  $700,000,000 / 2,500 = 280,000$  pages.

A DVD has 4GB =  $4 * 1,000 * 1,000 * 1,000$  bytes = 4,000,000,000 bytes. So a DVD can store  $4,000,000,000 / 2,500$  pages = 1,600,000 pages.

**Problem 3**

If a book of 220 pages is on average 2000 characters per page and a character is stored in one byte, what size should be the device needed to store 350 books?

**Solution:**

The book is stored on  $220 * 2,000$  bytes = 440,000 bytes. 350 books can be stored on  $350 * 440,000$  bytes = 154,000,000 bytes = 154,000 KB = 154 MB = 0,154 GB.

**Problem 4**

How many medical images with the average size of 150 KB can be stored on a CD of 700 MB? But on a 800 MB CD? But on a 4 GB DVD?

**Solution:**

An image has  $150 \text{ KB} = 150 * 1024 \text{ B} = 153,600 \text{ B}$ . A CD of 700 MB has  $700 * 1,000 * 1,000 \text{ B} = 700,000,000 \text{ B}$ , so it can store  $700,000,000 / 153,600$  images = 4,557 images.

A CD has 800MB =  $800 * 1,000 * 1,000 \text{ B} = 800,000,000 \text{ B}$ , so it can store  $800,000,000 / 153,600$  images = 5,208 images.

A 4GB DVD has  $4 * 1,000 * 1,000 * 1,000 \text{ B} = 4,000,000,000 \text{ B}$ , so it can store  $4,000,000,000 / 153,600$  images = 26,041 images.

**Problem 5**

How many bits can be store on a CD of 700 MB?

**Solution:**

A CD has 700MB =  $700 * 1,000 * 1,000 = 700,000,000 \text{ KB}$  in decimal system or  $700 \text{ MB} = 700 * 1,000 * 1,000 / 1,024 = 683593.75 \text{ KB}$  in binary system.

**Problem 6**

How many books of 512 pages (2560 characters per page, a character is stored in one byte) can be stored on a 700 MB CD? But on an external drive of 4 TB?

**Solution:**

The book is stored on  $512 * 2,560$  bytes = 1,310,720 bytes. A CD of 700 MB has  $700 * 1,000 * 1,000$  bytes = 700,000,000 bytes. So on a 700 MB CD can be stored  $700,000,000 / 1,310,720$  books = 534 books.

A 4TB hard drive has  $4 * 1,000 * 1,000 * 1,000 * 1,000$  bytes = 4,000,000,000,000 bytes. So on a 4 TB external drive can be stored  $4,000,000,000,000 / 1,310,720$  books = 3,051,757 books.

**Problem 7**

How many characters per page has a book of 500 pages stored on a file of 1 MB (we know that a letter is stored in 8 bytes)?

**Solution:**

1MB =  $1 * 1,024 * 1,024$  bytes = 1,048,576 bytes, so the book is stored in 1,048,576 bytes. The book has 500 pages. A page is stored on  $1,048,576 / 500$  bytes = 2097.152 bytes. A page has on average  $2,097.152 / 8$  letters = 262.14 letters.