# Where Files Go After Deletion?

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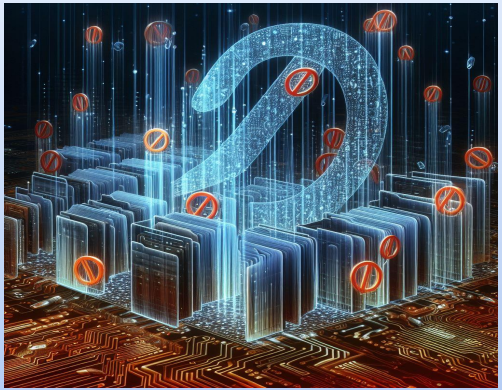
# Introduction



Hey, System. Welcome to the world of data-base.

Have you ever wondered where your data goes after you delete them from your system.

No!? Don’t worry. Here we discuss in detail and in fun way how system manage your data as bit of 0’s and 1’s and store them right location and tag them as a book in a unique bookshelf.

When you store some data in your system it is stored as if you put a book in a bookshelf(folder) of a library(your system).

Now when you delete it where the file goes?

With the previous analogy can you deduce some analogy?

Yes, if you thought that like the book is thrown out of the shelf after you take it away but still the librarian has the tag where the book was previously, your system has a physical storage for your data in the same folder and path after you delete it actually from folder.

But this is all about just analogy and how it works but how actually everything i.e. all data's tag remains physically?

1. What is physical location meaning?
2. How bit by bit data is stored?
3. How after deleting traces remains ?

These above questions are crucial in understanding the question **where files go after deletion?**

# What is Physical Location?

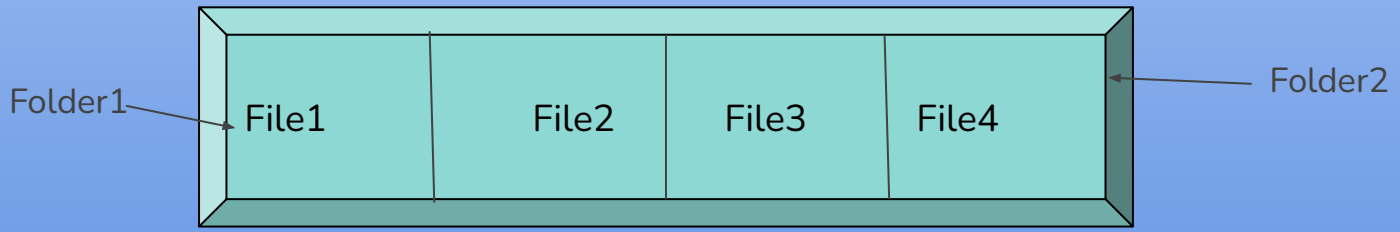
Without further delay let’s dive into what is physical location.

When we store some data in our system our hard disk gets divide its space and allocate a memory size to your data. That division is a folder and size is your data’s physical size.

Electrons flows with certain manner to create signals up(1) and down(0) and store data as a bit. Like a data of size 1KB meaning electrical signal has to perform 1024*8 types of up and down combination. As, 1KB=1024 Byte and 1 Byte=8 Bit. And 1 Bit is either a signal up(1) or signal down(0).

# How traces remains?

Now, when we delete a data electrons stop flowing in that particular location of Hard Disk. Just making electrical signal inactive. Electrons are still there waiting for dancing again. When we want to recover the deleted data we just need to start those electors moving there. The process is as simple as that.



# How to securely delete data?

When we delete data we have seen just now, it remains with it's electron combination still there as inactive. And it waits for new data to come there with new elector combination to overwrite it. Different different system use different techniques to overwrite data over the time but most of the systems overwrites data when disk space is no more available or you intentionally overwrite it before you delete.

Obviously, overwriting is the secure way by replace the electron combination of the old data to make it hard to get back the old combination. How to get back old combination is different topic. So, you can search in google and get information how it actually works. But for now we will just focus on how to intentionally overwrite data rather than waiting for system to overwrite.

# Command Line to Shred Data

In Mac and Linux it is easy to shred. Direct command is as follow:

```
Kali > $ shred -f -n 20 main.jpg
```

In windows you have to open some bash software e.g. git bash and run then same command.

To shred all files of a directory open terminal there and write the following code.

# Code:

```
Kali > $ filenames=$(ls)
Kali > $ dir=$(pwd)
Kali > $ for i in $filenames
do
shred -f -n 20 -v $dir/$i
done
```

# References:

For more details, you can explore the GeeksforGeeks article on free space management[1]. Source: Conversation with Copilot, 25/5/2024

(1) Free space management in Operating System - GeeksforGeeks. https://www.geeksforgeeks.org/free-space-management-in-operating-system/.

(2) Free Space Management in OS | Scaler Topics. https://www.scaler.com/topics/free-space-management-in-os/.

(3) hard drive - What happens when a file is deleted? Does the disk space .... https://superuser.com/questions/1598828/what-happens-when-a-file-is-deleted-does-the-disk-space-decrease-or-does-it-sta.

(4) File Allocation Methods – Operating System. https://ebooks.inflibnet.ac.in/csp3/chapter/file-allocation-methods/.