1.xv6 only has **data journaling** and called logging in xv6, which makes all pending updates (including file contents and metadata) are recorded in the journal before being written to the disk. This way, even if the system crashes during the update process, the data can be recovered by replaying the journal, ensuring the consistency of the file system.

2.

Aspect	Link Count	Reference Count
Definition	Number of directory entries pointing to an inode.	Number of active references to a file object in memory.
Tracks	File's presence in the directory structure.	File's usage by active processes.
Update Events	Incremented when a hard link is created, decremented when a file or link is deleted.	Incremented when a file is opened, decremented when it is closed.
Reaches Zero	File data is deleted from disk if no other links exist.	File object in memory is deallocated if no processes are using it.
Managed By	File system's inode structure.	File system's file descriptor system.

3.After compile, you can use the tool in Linux like debugfs…and so on. These commands can help you check the data block pointers of a specific inode to ensure that the doubly-indirect block correctly points to other data blocks.

```
nieves@nieves-VirtualBox:~/xv6-riscv-0609$ sudo debugfs /dev/sda1
debugfs 1.46.5 (30-Dec-2021)
debugfs: Bad magic number in super-block while trying to open /dev/sda1
debugfs:  stat
stat: Filesystem not open
debugfs:
```