# CS314: Lab Report Assignment 10 - Immediate Files
# 210010020 & 210010006

In MINIX OS, there are two types of files: Immediate files and Regular files. Let's explore the differences between them:

1. Immediate Files:

   o An immediate file is a special type of file whose data is not stored in a separate data block. Instead, the data is directly embedded inside the inode itself.

   o In MINIX, an inode is 64 bytes long, and typically, 40 bytes are used to hold pointers to data blocks.

   o For immediate files, these 40 bytes are utilized to store the actual file contents directly within the inode, rather than using pointers to data blocks.

   o Immediate files are useful for small files where the data can fit within the inode itself.

   o By avoiding the need for an additional data block, immediate files can be more efficient in terms of storage and access time.

2. Regular Files:

   o Regular files follow the conventional approach of storing data in separate data blocks.

   o In MINIX, regular files use data blocks to store their content.

   o Each data block can hold a fixed amount of data (e.g., 1 kilobyte).

   o Regular files are suitable for larger files where the data exceeds the size that can be accommodated within the inode.

Files modified: Following files have been modified to implement immediate files.

1. /minix/include/minix/const.h
2. /minix/fs/mfs/link.c
3. /minix/fs/mfs/misc.c
4. /minix/fs/mfs/read.c
5. /minix/fs/mfs/write.c
6. /minix/fs/mfs/table.c
7. /minix/fs/mfs/proto.h
8. /minix/servers/vfs/link.c
9. /minix/servers/vfs/open.c
10. /minix/lib/libc/gen/fslib.c

Output after performing changes:

Creating immediate file, Writing to Immediate file and reading from immediate file.

```
Mar 31 12:09:59 10 kernel: Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 3
Mar 31 12:09:59 10 kernel: Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 3
Mar 31 12:12:27 10 kernel: Minix3 [210010020_210010006]: File Created: 7
Mar 31 12:12:27 10 kernel: Minix3 [210010020_210010006]: Writing to Immediate File.
Mar 31 12:12:27 10 kernel: Minix3 [210010020_210010006]: File Write: 7; nbytes = 10; offset = 10
Mar 31 12:12:53 10 kernel: Minix3 [210010020_210010006]: Reading from Immediate File.
Mar 31 12:12:53 10 kernel: Minix3 [210010020_210010006]: File Contents of Immediate File:
Mar 31 12:12:53 10 kernel: wrtyuiop[
Mar 31 12:12:53 10 kernel: Minix3 [210010020_210010006]: EOF - Immediate File
Mar 31 12:12:53 10 kernel: Minix3 [210010020_210010006]: File Read: 7; nbytes = 4096; offset = 0
Mar 31 12:16:09 10 kernel: Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 3
Mar 31 12:16:09 10 kernel: Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 3
Mar 31 12:16:23 10 kernel: Minix3 [210010020_210010006]: File Read: 5; nbytes = 4096; offset = 182
Mar 31 12:16:23 10 kernel: Minix3 [210010020_210010006]: File Read: 5; nbytes = 4096; offset = 182
Mar 31 12:17:08 10 kernel: Minix3 [210010020_210010006]: File Created: 6
Mar 31 12:17:08 10 kernel: Minix3 [210010020_210010006]: Writing to Immediate File.
Mar 31 12:17:08 10 kernel: Minix3 [210010020_210010006]: File Write: 6; nbytes = 29; offset = 29
Mar 31 12:17:18 10 kernel: Minix3 [210010020_210010006]: Reading from Immediate File.
Mar 31 12:17:18 10 kernel: Minix3 [210010020_210010006]: File Contents of Immediate File:
Mar 31 12:17:18 10 kernel: 123456780123456789 0123456789
Mar 31 12:17:18 10 kernel: Minix3 [210010020_210010006]: EOF - Immediate File
Mar 31 12:17:18 10 kernel: Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 0
Mar 31 12:17:45 10 kernel: Minix3 [210010020_210010006]: File Created: 8
Mar 31 12:17:45 10 kernel: Minix3 [210010020_210010006]: File Write: 8; nbytes = 35; offset = 35
Mar 31 12:17:52 10 kernel: Minix3 [210010020_210010006]: File Read: 8; nbytes = 4096; offset = 35
```

```
Minix3 [210010020_210010006]: File Read: 8; nbytes = 4096; offset = 35
12345678901234567890123455567890123
Minix3 [210010020_210010006]: File Read: 8; nbytes = 4096; offset = 35
#
#
# cat t3.txt
Minix3 [210010020_210010006]: Reading from Immediate File.
Minix3 [210010020_210010006]: File Contents of Immediate File:
12345678012345678901234456789
Minix3 [210010020_210010006]: EOF - Immediate File
Minix3 [210010020_210010006]: File Read: 6; nbytes = 4096; offset = 0
#
#
#
# rm t4.txt
#
# ls
link.c open.c read.c run.sh t2.txt t3.txt
#
# rm t3.txt
# cat t3.ttxttttttttt
cat: t3.ttxttttttttt: No such file or directory
# cat t3.txt
cat: t3.txt: No such file or directory
# S
```