

# Operating Systems Lab - CS 314

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## 1 Abstract

The task in this lab is to implement immediate files in the Minix File System, for files of size up to 32 bytes. This implementation is only for the file system mounted at `/home`.

### 1.1 Functionalities & Micro Tasks

- **File Creation:** The start has to be done by creating the file as an immediate one. When a file grows beyond 32B, then it has to be made into a regular file.
- **File Read:** If it is an immediate file, it has to be responded with the inode structure contents. If not, it has to follow the default behavior of looking up zones.
- **File Write:** The task is similar to read. The care has to be taken to ensure that if inode structure has to be written, then the new file size is still within 32B. When a regular file shrinks to less than 32 bytes, there is no need to come back to immediate mode.
- **File Delete:** The deleting of immediate files does not require any handling of zones.

## 2 Images & Proof of Concept

The following section shows the images as the proof of concept to the code altered to accommodate required statements.

```
Minix: PID 216 exited
# touch newFile.txt
Minix: PID 217 created
Alloted Quantum is: 200, Used Quantum is: 200
PID 192 swapped in
Minix3: File Created: 2
Minix: PID 217 exited
# _
```

Figure 1: File Creation

```
Minix: PID 224 exited
# echo "Hello World!" > newFile.txt
Minix3: Writing to Immediate File.
Minix3: File Write: 2; nbytes = 13; offset = 13
#
```

Figure 2: File Write - Upto 32 bytes

```
Minix: PID 224 exited
# echo "Hello World!" > newFile.txt
Minix3: Writing to Immediate File.
Minix3: File Write: 2; nbytes = 13; offset = 13
# echo "Hello World!Alloted Quantum is: 200, Used Quantum is: 200"

# echo "T" >> newFile.txt
Minix3: Writing to Immediate File.
Minix3: File Write: 2; nbytes = 2; offset = 15
#
```

Figure 3: File Write: Concatenation to existing file - Upto 32 bytes

```
Minix: PID 224 exited
# echo "Hello World!" > newFile.txt
Minix3: Writing to Immediate File.
Minix3: File Write: 2; nbytes = 13; offset = 13
# echo "Hello World!Alloted Quantum is: 200, Used Quantum is: 200"

# echo "T" >> newFile.txt
Minix3: Writing to Immediate File.
Minix3: File Write: 2; nbytes = 2; offset = 15
# echo "This line is proof for exceeding Immediate File" >> newFile.txt
Minix3: File Write: 2; nbytes = 48; offset = 63
# _
```

Figure 4: File Write: Concatenation to existing file - Beyond 32 bytes

```
Minix: PID 232 exited
# cat newFile.txt
Minix: PID 233 created
Alloted Quantum is: 200, Used Quantum is: 200
PID 208 swapped in
Minix3: Reading from Immediate File.
Minix3: File Contentsof Immediate File:
Hello
Minix3: EOF - Immediate File
Minix3: File Read: 2; nbytes = 4096; offset = 0
Minix: PID 233 exited
# _
```

Figure 5: File Read

```
Minix: PID 234 exited
# rm newFile.txt
Minix: PID 235 created
Alloted Quantum is: 200, Used Quantum is: 200
PID 210 swapped in
Minix: PID 235 exited
# _
```

Figure 6: File Delete