

Customized Virtual File System(CVFS)

- **Platform Used :**

Windows NT platform OR Linux Distribution.

- **Architectural Requirement**

Intel 32 bit Processor.

- **User Interface :**

Command User Interface(CUI).

- **SDK used :**

None.

- **Technology used :**

System programming using C.

Introduction of CVFS :

- In this project we used all the Data Structure which are used by operating system(OS) to perform file system operation.
- As per name 'virtual' in the CVFS, we perform all the operation on the primary memory storage(RAM).
- Data Structure created in the CVFS :
 1. Inode Table
 2. File Table
 3. UAREA
 4. User File Descriptor Table(UFDT)

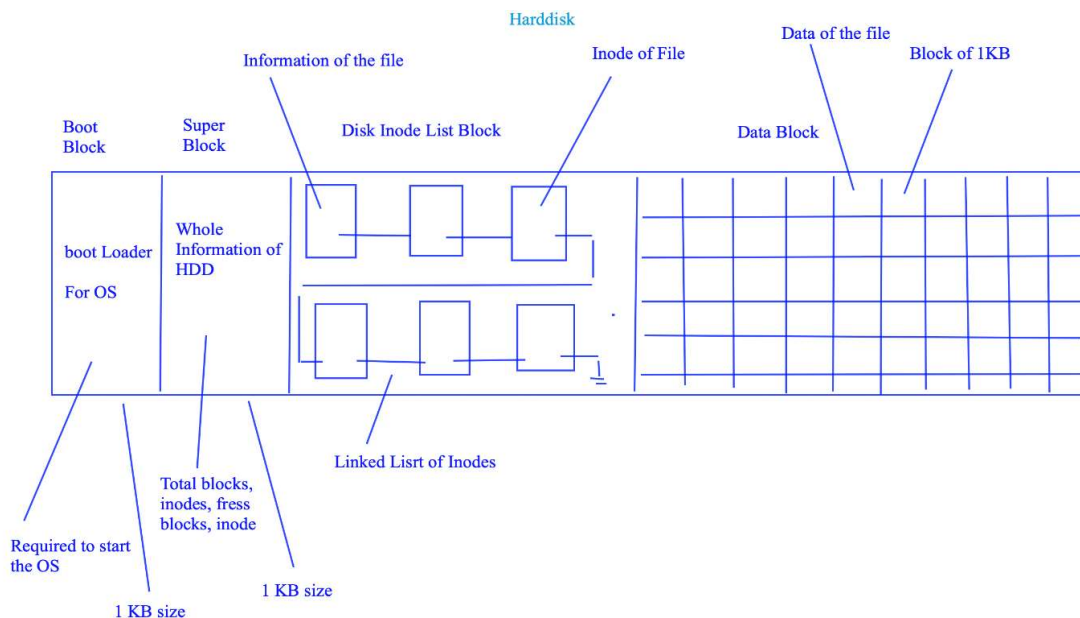
5. Super block
6. Disk Inode List Block(DILB)
7. Data Block
8. Boot block

- We provide basic and necessary operation on CVFS as below :

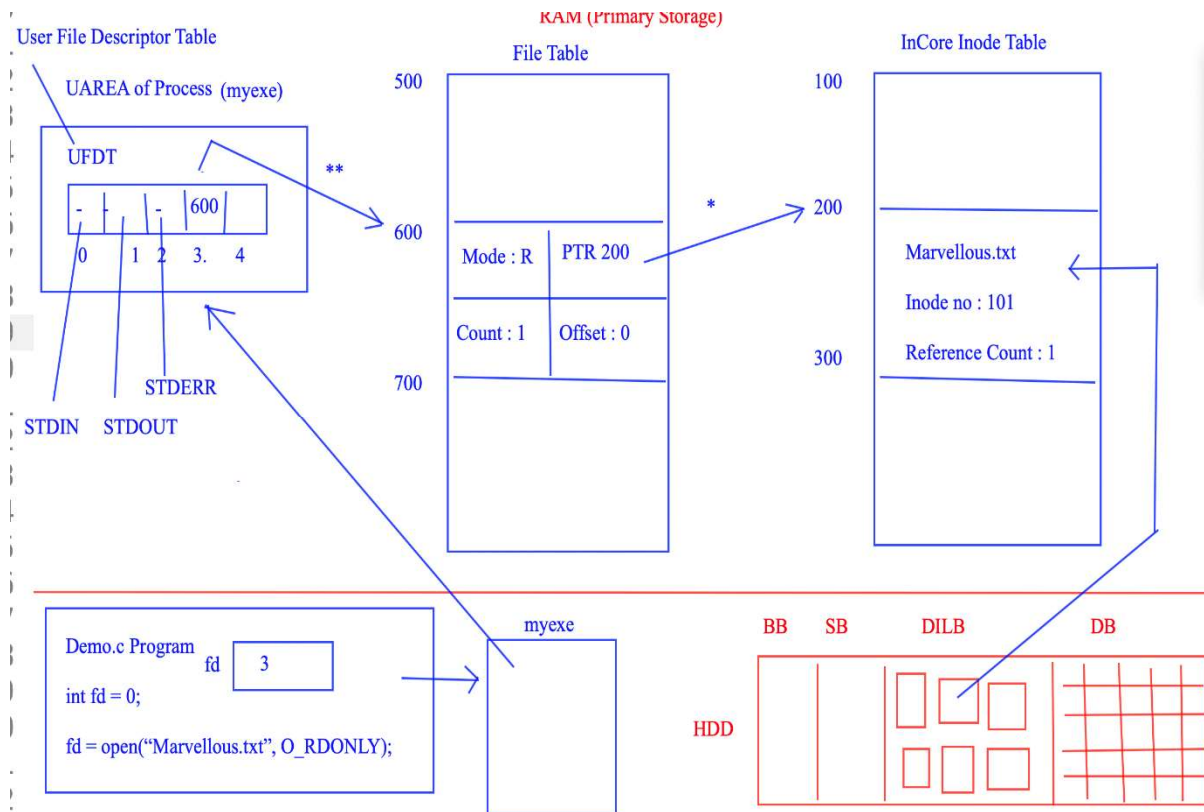
1. Create
2. Open
3. Close
4. Read
5. Write
6. Lseek
7. RM
8. LS
9. Stat
10. Fstat

- By using this project we can get overview of (UNIX file system) on any platform.

- Diagram of Hard Disk



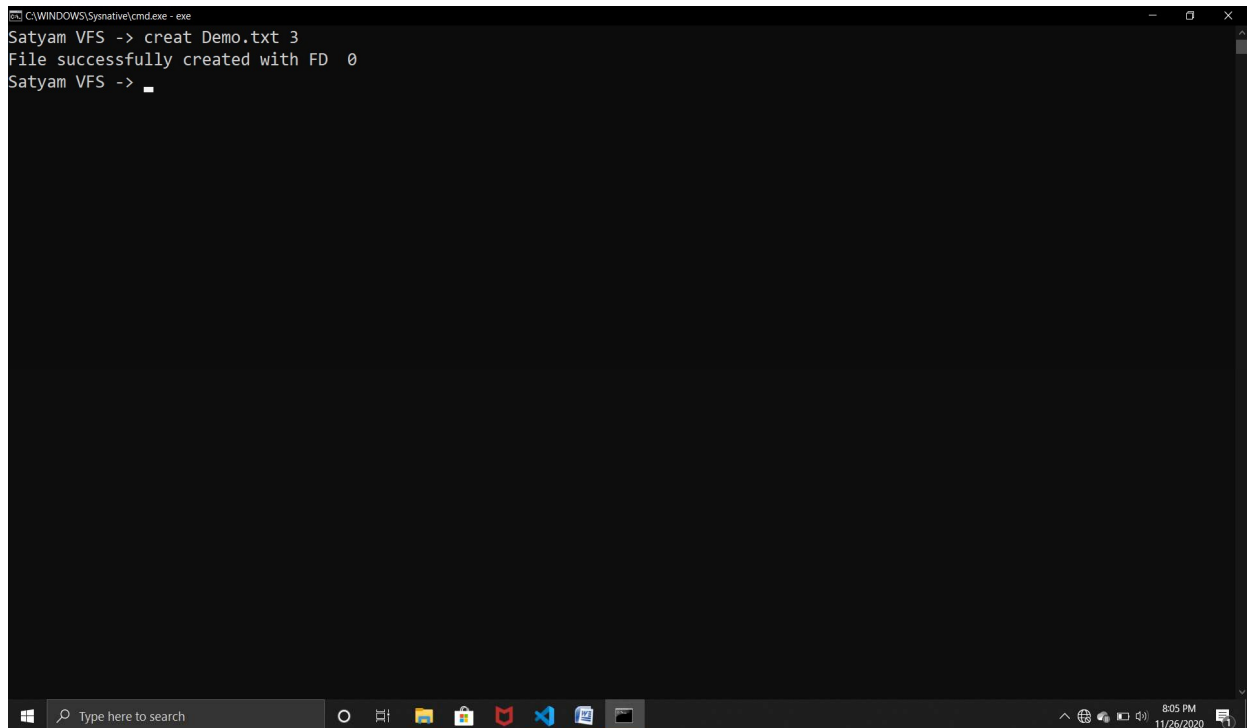
- Diagram of whole process :



Operation Performed by using CVFS as below

1. Create File :

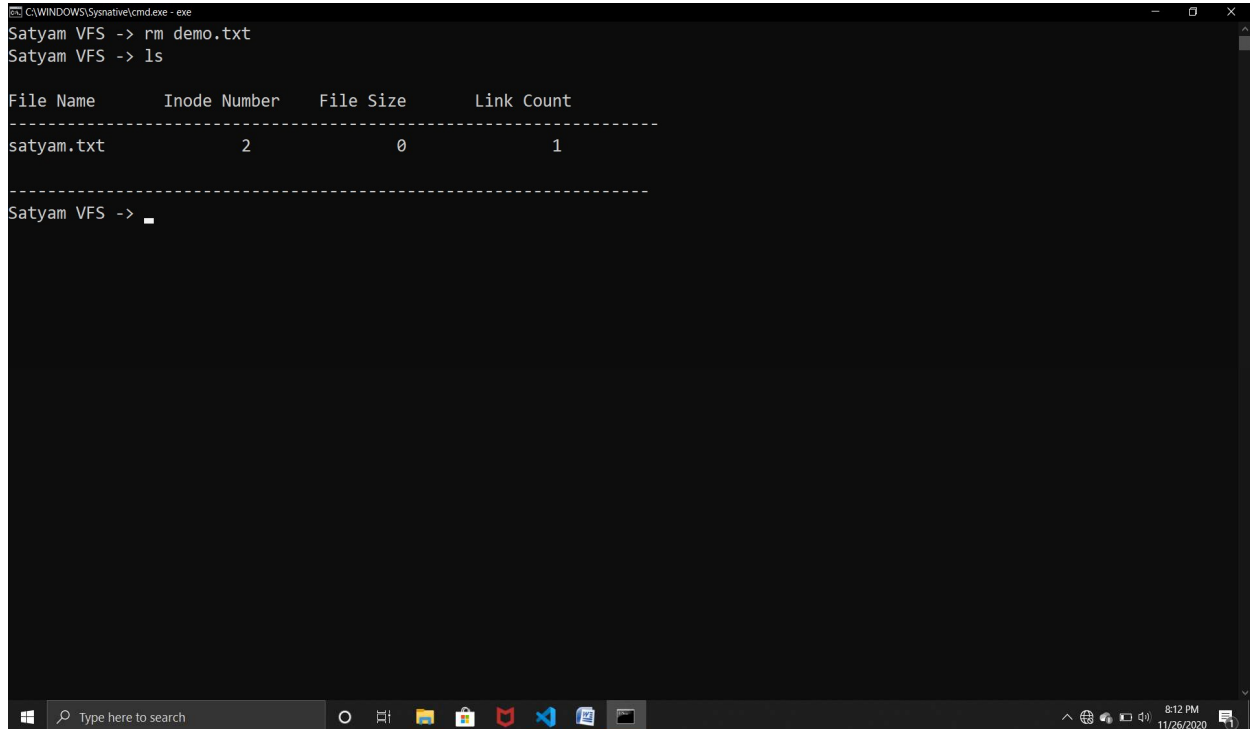
- **Description** : Used to create the new regular file.
- **Usages** : creat File _name Permission



```
C:\WINDOWS\Synative\cmd.exe - exe
Satyam VFS -> creat Demo.txt 3
File successfully created with FD 0
Satyam VFS -> _
```

2. Delete File :

- **Description** : Used to delete regular file.
- **Usages** : `rm File_name`



```
C:\WINDOWS\Synative\cmd.exe - exe
Satyam VFS -> rm demo.txt
Satyam VFS -> ls
```

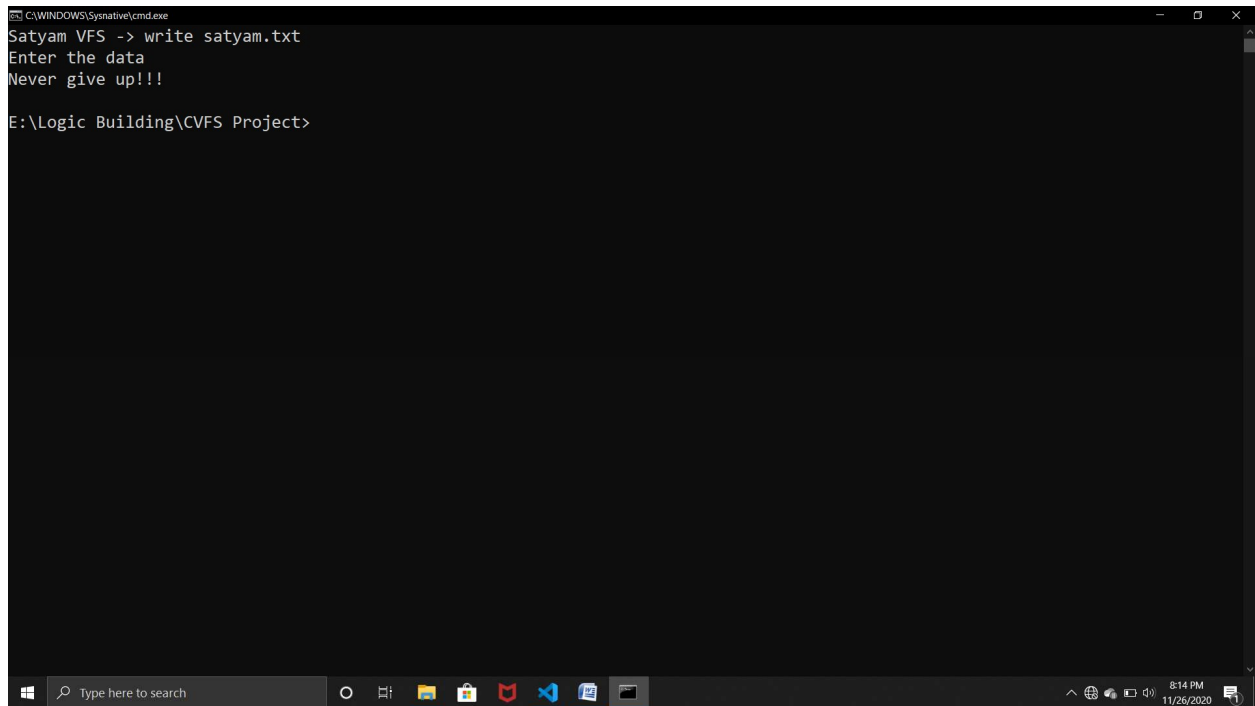
File Name	Inode Number	File Size	Link Count
satyam.txt	2	0	1

```
Satyam VFS -> _
```

The screenshot shows a Windows command prompt window with a dark background. The title bar reads 'C:\WINDOWS\Synative\cmd.exe - exe'. The user has entered the command 'rm demo.txt' and then 'ls'. The output of 'ls' is a table with four columns: 'File Name', 'Inode Number', 'File Size', and 'Link Count'. The table contains one row for 'satyam.txt' with values 2, 0, and 1 respectively. The prompt 'Satyam VFS -> _' is visible at the bottom of the command history.

3. Write :

- **Description** : Used to write in regular file.
- **Usages** : write File _name
 'write the data that we want to write'

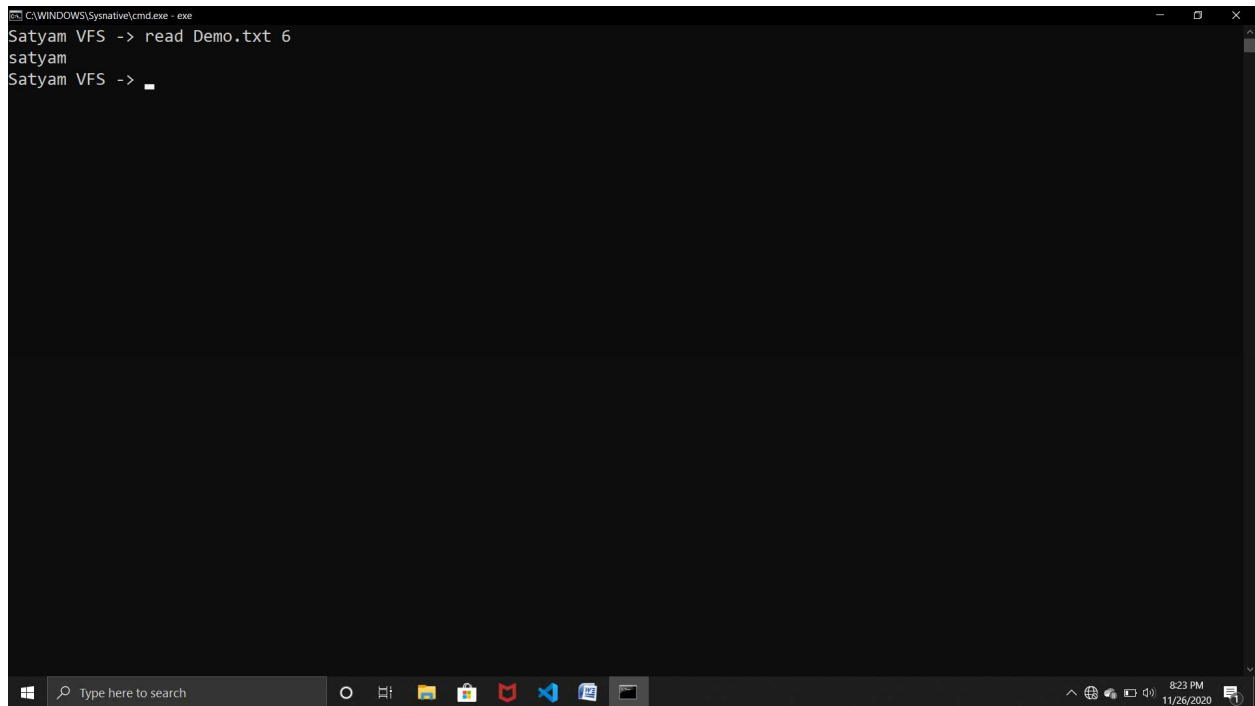


A screenshot of a Windows command prompt window titled "C:\WINDOWS\system32\cmd.exe". The window shows the following text:
Satyam VFS -> write satyam.txt
Enter the data
Never give up!!!
E:\Logic Building\CVFS Project>

The window has a standard Windows taskbar at the bottom with the search bar, task view button, and several application icons (File Explorer, Edge, etc.). The system tray shows the time as 8:14 PM on 11/26/2020.

4. Read File :

- **Description :** Used to read the number of bytes from regular file.
- **Usages :** read File _name no_of_bytes

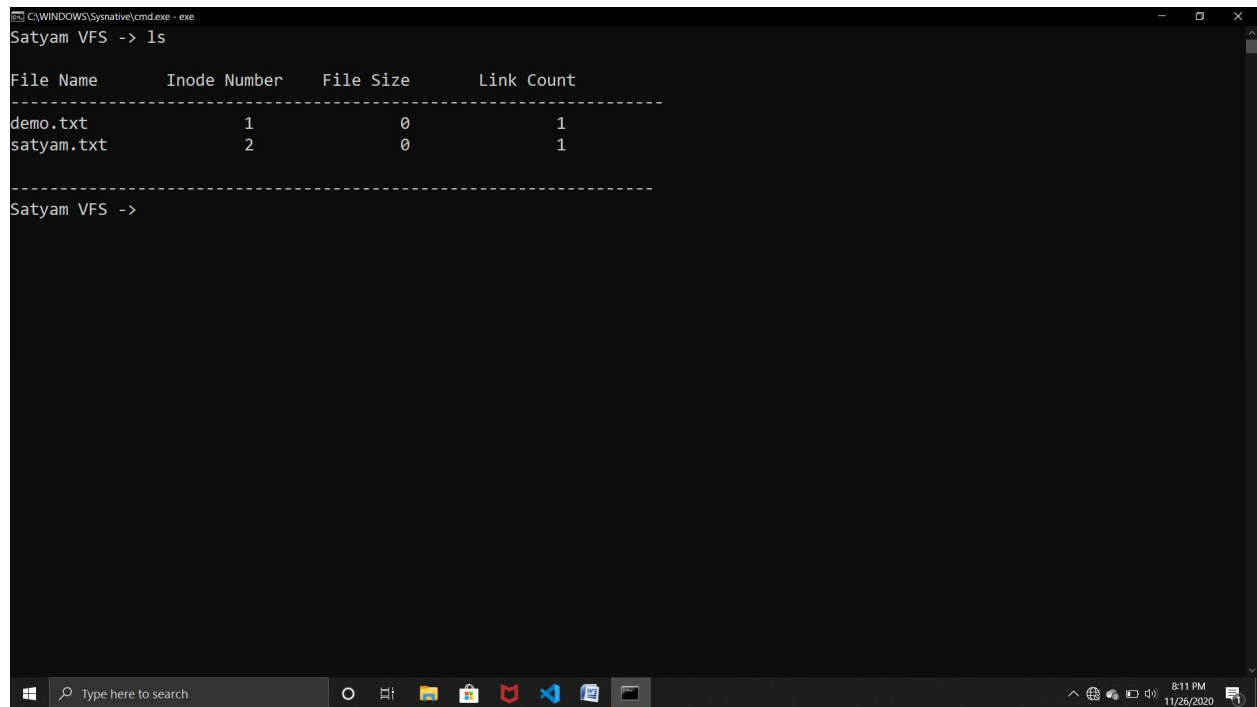


```
CA\WINDOWS\system32\cmd.exe - exe
Satyam VFS -> read Demo.txt 6
satyam
Satyam VFS -> _
```

The screenshot shows a Windows command prompt window with a dark background. The title bar reads 'CA\WINDOWS\system32\cmd.exe - exe'. The command prompt shows the user 'Satyam' at the 'VFS' prompt. The user enters 'read Demo.txt 6', and the prompt changes to 'satyam'. The user then enters a single underscore character '_'. The Windows taskbar is visible at the bottom, showing the search bar and several application icons. The system clock in the bottom right corner indicates 8:23 PM on 11/26/2020.

5. List of File :

- **Description** : Used to list out regular file.
- **Usages** : ls

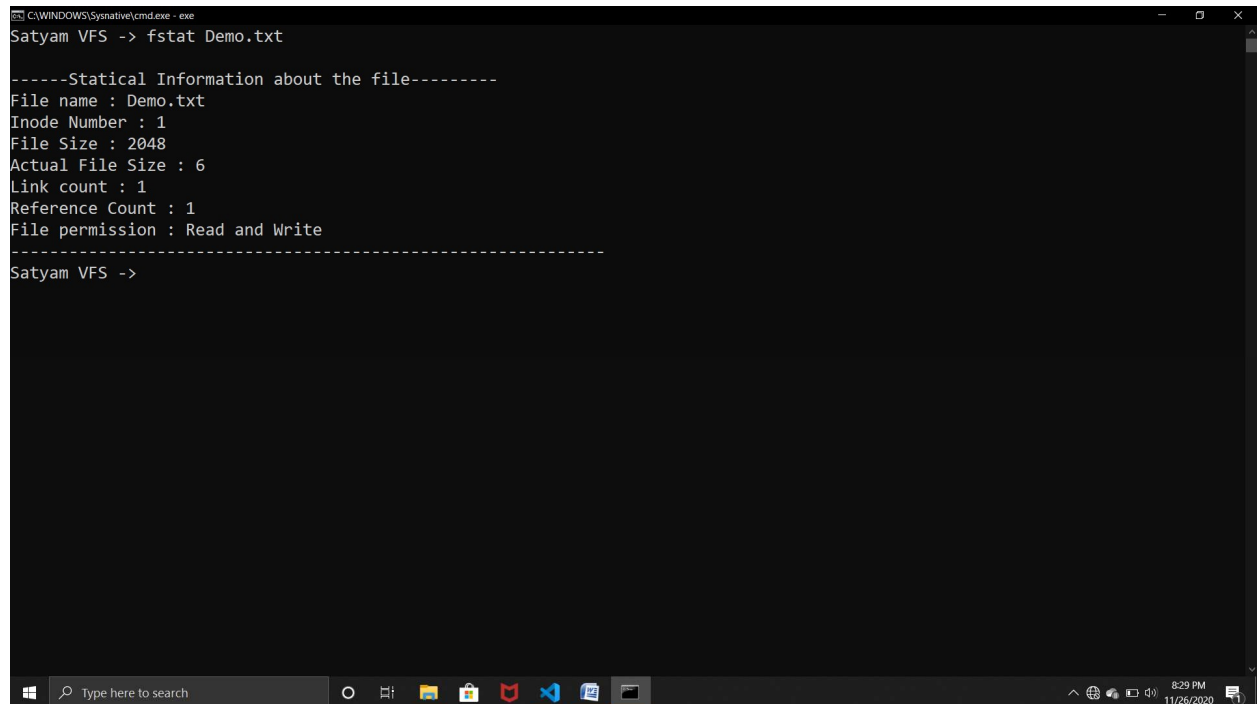


The screenshot shows a Windows command prompt window titled "C:\WINDOWS\Sysnative\cmd.exe - exe". The prompt is "Satyam VFS -> ls". The output is a table with four columns: "File Name", "Inode Number", "File Size", and "Link Count". The table lists two files: "demo.txt" with Inode Number 1, File Size 0, and Link Count 1; and "satyam.txt" with Inode Number 2, File Size 0, and Link Count 1. The prompt then shows "Satyam VFS ->" again.

File Name	Inode Number	File Size	Link Count
demo.txt	1	0	1
satyam.txt	2	0	1

6. File statistics :

- **Description :** Used to display information of regular file.
- **Usages :** fstat File _name

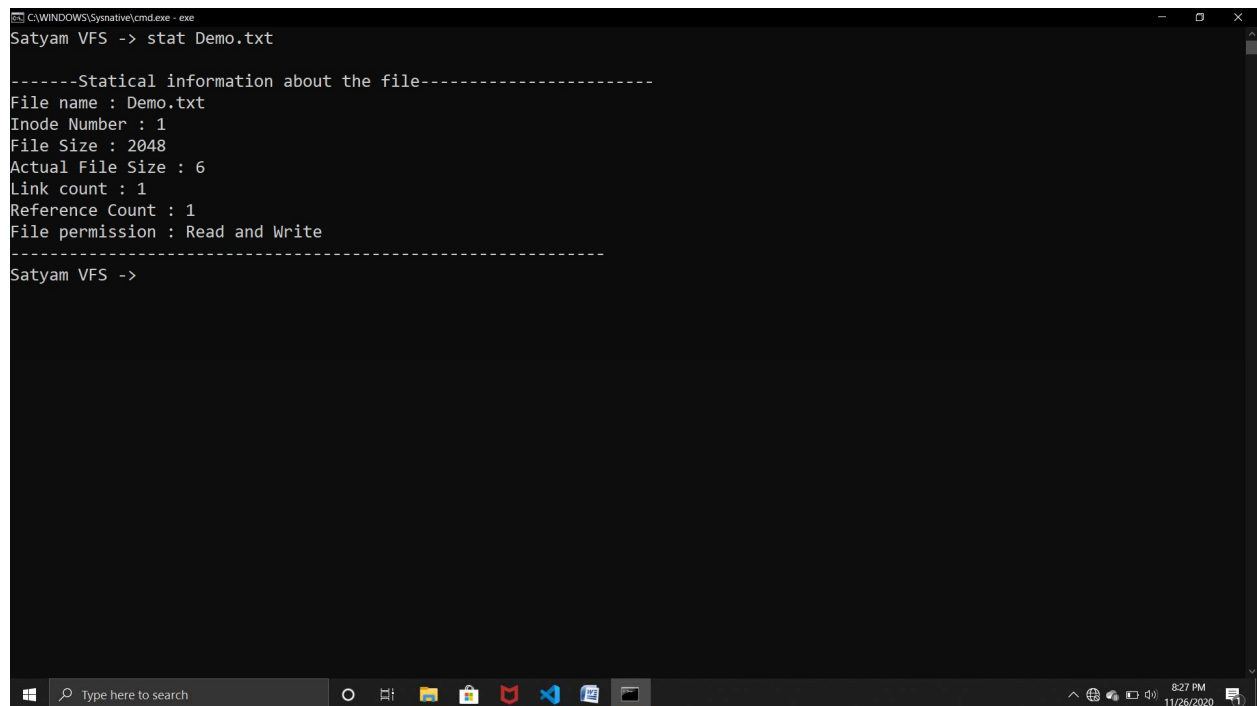


```
CA\WINDOWS\System32\cmd.exe - exe
Satyam VFS -> fstat Demo.txt

-----Statical Information about the file-----
File name : Demo.txt
Inode Number : 1
File Size : 2048
Actual File Size : 6
Link count : 1
Reference Count : 1
File permission : Read and Write
-----
Satyam VFS ->
```

7. Statistics of File :

- **Description** : Used to display information of regular file.
- **Usages** : stat File _name

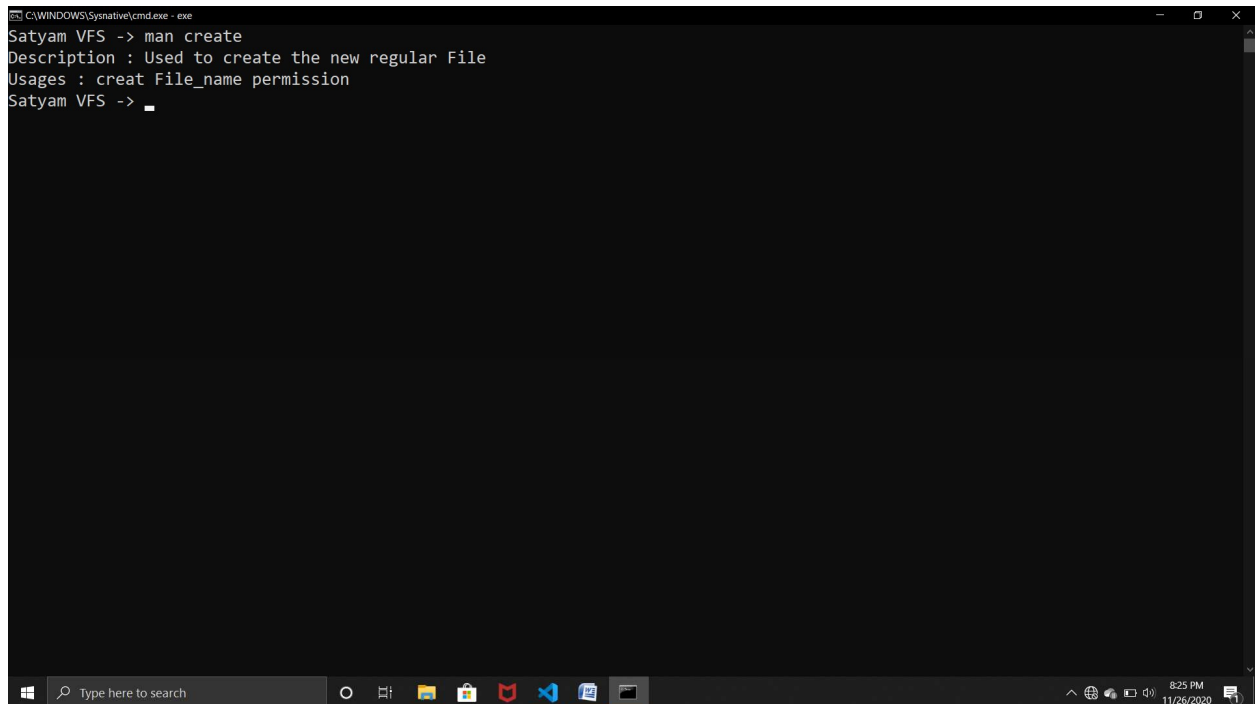


```
C:\WINDOWS\Sysnative\cmd.exe - exe
Satyam VFS -> stat Demo.txt

-----Statical information about the file-----
File name : Demo.txt
Inode Number : 1
File Size : 2048
Actual File Size : 6
Link count : 1
Reference Count : 1
File permission : Read and Write
-----
Satyam VFS ->
```

8. man :

- **Description** : Used to give information of the command
- **Usages** : rm cmd_name



```
C:\WINDOWS\System32\cmd.exe - exe
Satyam VFS -> man create
Description : Used to create the new regular File
Usages : creat File_name permission
Satyam VFS -> _
```

The screenshot shows a Windows command prompt window with a black background and white text. The title bar at the top reads 'C:\WINDOWS\System32\cmd.exe - exe'. The command prompt shows the user 'Satyam VFS' entering the command 'man create'. The output displays the description and usage of the 'create' command: 'Description : Used to create the new regular File' and 'Usages : creat File_name permission'. The prompt then returns to 'Satyam VFS -> _'.