

# Project Report

## File Management System

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IT308 - Operating Systems

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## Introduction -

The project tries to implement a personal file system in C++. The file system is built on top of a host file system, enabling access to files located in different host file systems in a uniform way. The file system has been built by using a file allocation table (FAT) and implemented using virtual disk. The virtual disk has been implemented as a file with allocated bits.

## Description -

The following are the details of project :

- 20 MB virtual disk
- 20 KB block size
- There are 32 file descriptors of 36 bytes, each in size.
- The first 512 blocks store the metadata such as superblock, FA table or directories while the remaining block store files and data.

As we need some structure to store the information about each file, the metadata, we are using FAT to store the detail of the next block in file where the data is stored. The index table shows the value -1 when there is no more block in file. The value -2 signifies the block is free or unallocated.

The code contains following important functions:

1. fcreate() - This function creates a new file in the virtual disk space.
2. fopen() - To read or write from a file, the file has to be opened first from its location in the virtual disk. This function opens the file at a given location.
3. frename()- The function is used to rename an existing file
4. fread()/fwrite()- The functions are used whenever there is a need to write or read data from the file that is currently open.
5. flist()- The function lists down all the existing files that have not been removed in the virtual disk.
6. fclose() - Once read/write operation is complete, the file needs to be closed to free the pointer pointing to it. This is done by the close function.

7. fremove() - The function deletes the file from the virtual disk/

## Application -

The Virtual file system like this can be used for caching and utility functions for the main file system of operating system.

## Future Scope -

There exists a wide scope of possibilities for this file system to expand. Some of them are :

1. The size of block can be changed to take value as defined by user. This would make memory use more efficient.
2. Privacy and protection or security features can be added.
3. The attributes in the metadata stored can be increased to accomodate attributes for permissions of file.