

File System Development

- 100 blocks (sectors) numbered from 0-99, each contains 512 bytes of data.
- Front end program that processes commands:
 - File create, open, close, delete, read, write, and seek functions
- When the end of the input data is reached, the following information will be displayed:
 - Directory (illustrating it's hierarchical structure)
 - Length of each file (in bytes)
 - Number of free directory and user data blocks.

Directory Structure:

```
DECLARE 1 BLOCK0,  
    2 BACK FIXED BIN (31),          /* ALWAYS ZERO IN THIS BLOCK*/  
    2 FRWD FIXED BIN (31),          /*BLOCK NUMBER OF SECOND DIRECTORY BLOCK OR ZERO*/  
    2 FREE FIXED BIN (31),          /*BLOCK NUMBER OF FIRST UNUSED BLOCK*/  
    2 FILLER CHARACTER (4),         /*UNUSED*/  
    2 DIR (31),                     /*DIRECTORY ENTRIES*/  
        3 TYPE CHARACTER (1),       /*'F' = FREE, 'D'= DIRECTORY, 'U'= USER DATA*/  
        3 NAME CHARACTER (9),       /*FILE NAME, LEFT JUSTIFIED, BLANK FILLED*/  
        3 LINK FIXED BIN (31),      /*BLOCK NUMBER OF FIRST BLOCK OF FILE*/  
        3 SIZE FIXED BIN (15),      /* NUMBER OF BYTES USED IN THE LAST BLOCK OF THE FILE*/
```

Initially all the blocks are initialized with list of directories, as below:

Block directory : [0, 0, 0, [['F', 0, 0, 0], ['F', 0, 0, 0], ['F', 0, 0, 0], ['F', 0, 0, 0],....., ['F', 0, 0, 0]]]

Directory name:

Dir
Dir/Subdir
Dir/Subdir/Sample

Data File Format

Data files also form linked lists. The structure of the data file block is as follows:

```
DECLARE 1 DATA_BLOCK,  
    2 BACK FIXED BIN (31),          /*BLOCK NUMBER OF PREVIOUS BLOCK*/  
    2 FRWD FIXED BIN (31),          /*BLOCK NUMBER OF SUCCESSOR BLOCK*/  
    2 USER_DATA CHAR (504),        /*USER DATA BYTES*/
```

Block file : [0,0, data]

Filename name:

File.txt
Dir/file2.txt
Dir/Subdir/file3.txt

Commands

Create type name

Type : -u - storing file
 -d - storing directory

Name: filename is stored with '.' Ex: file.txt

OPEN mode name

Mode : -i - Input mode (READ and SEEK commands)
 -u - Update mode (READ, WRITE, and SEEK commands)
 -o - Output mode (WRITE command), pointer points to last byte of file

Name : takes only file name

```
$ help open
```

```
OPEN mode name
```

```
mode = (I)        'INPUT'    : Read and Seek                    (or)  
          (U)        'UPDATE'   : Read,Write (rewrite), Seek                    (or)  
          (O)        'OUTPUT'   : Write(padding)
```

Update mode open will go to seek position then read and writes from that point.

Input mode seek and read

Output mode just writing to last of text

CLOSE

Closes the file last opened or created

DELETE name

Name : directory name- deleted only if the directory is empty,
 Filename – sets it to 'F'(free) and sets the file pointer to default

WRITE n 'data'

N - number of bytes writing
Data - content of the file

READ n

N - reads n bytes

SEEK base offset

Base - -1 indicating the beginning of the file,
 0 the current position in the file, or
 +1 end of the file

```

-----+-----> DELETE -----+
!!                                           !
!+-----> CREATE -----+-----> WRITE -----+-----> CLOSE -----+----->
!!                                           !
!!                                           !
!!                                           !
!!                                           !
! +-----> OPEN -----+-----> READ -----+-----> CLOSE -----+-----
!                                           ! ! ! ! !
!                                           ! +-----> WRITE -----+ !
!                                           ! ! ! ! !
!                                           ! +-----> SEEK -----+ !
!                                           +-----<-----<-----<-----<-----+
+-----<-----<-----<-----<-----<-----<-----<-----+

```

Output:

```

$ ls
/
|--dir1
|-- |--sub1
|-- |--hello
|-- |--view
|-- |--long.txt
|--small.txt
|--csueb
|--basic
|--file.txt
|--memo
|--essay
|--content.txt
|--subject
|--dir3
|-- |--subdir1
|-- |--subdir2
|-- |--subdir3
|-- |--subdir4
|-- |--subdir5
|-- |--subdir6
|-- |--subdir7
|-- |--subdir8
|-- |--subdir9
|--dir5
|--dir6
|--dir7
|--dir8
|--dir9
|--dir10
|--dir11
|--dir12
|--dir13
|--dir14
|--base
|--point
|--back.doc
|--write
|--des
|--aes
|--block.docx
|--dump
|--compute
|--123
|--shift
|--last_32dir

```

```
|--new_block
|--giga
|--encode.txt
|--blocks
```

```
$ close
```

```
$ open -i dir1/long.txt
```

```
length of file: dir1/long.txt is 1410 bytes
```

```
$ seek -1 1
```

```
Pointing to beginning of file
```

```
start_point 1
```

```
$ read 100
```

```
n the form of the essay, which is commonly used, the writer makes a thesis and
argument, then object
```

```
$ cat dir1/long.txt
```

In the form of the essay, which is commonly used, the writer makes a thesis and argument, then objects to their own argument (with a counterargument), but then counters the counterargument with a final and novel argument. This form benefits from presenting a broader perspective while countering a possible flaw that some may present. This type is sometimes called an ethics paper. Exemplification An exemplification essay is characterized by a generalization and relevant, representative, and believable examples including. Writers need to consider their subject, determine their purpose, consider their audience, decide on specific examples, and arrange all the parts together when writing an exemplification essay. Familiar An essayist writes a familiar essay if speaking to a single reader, writing about both themselves, and about particular subjects. notes that "the genre's heyday was the early nineteenth century," and that its greatest exponent was. She also suggests that while critical essays have more brain than the heart, and personal essays have more heart than brain, familiar essays have equal measures of both. History (thesis) A history essay sometimes referred to as a thesis essay describes an argument or claim about one or more historical events and supports that claim with evidence, arguments, and references. The text makes it clear to the reader why the argument or claim is as such.

```
$ seek 1 -6
```

```
Pointer is at end of file
```

```
start_point 1404
```

```
$ read 10
```

```
such. <EOF>
```

```
$ close
```

```
$ open -o dir1/long.txt
```

```
length of file: dir1/long.txt is 1410 bytes
```

```
$ write 10 type to here search
```

```
File length 1429 Bytes
```

```
$ read 1429
```

```
Open file in Input/Update mode to read
```

```
$ close
```

```
$ open -u dir1/long.txt
```

```
length of file: dir1/long.txt is 1429 bytes
```

```
$ read 1429
```

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\$ read 1430

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