Super Block

```
exdump.txt
ksh@ubuntu:~/Documents/OS/CMSI387/homework/csi-fs/image$ hexdump -C image
00000000  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00000400  40 00 00 00 00 02 00 00  19 00 00 00 e1 01 00 00  |@...............|
00000410  31 00 00 00 01 00 00 00  00 00 00 00 00 00 00 00  |1...............|
00000420  00 20 00 00 00 20 00 00  40 00 00 00 00 00 00 00  |. ... ..@.......|
00000430  66 a2 81 51 02 00 ff ff  53 ef 00 00 01 00 00 00  |f..Q....S.......|
00000440  92 9f 81 51 00 00 00 00  00 00 00 00 01 00 00 00  |...Q............|
00000450  00 00 00 00 0b 00 00 00  80 00 00 00 38 00 00 00  |............8...|
00000460  02 00 00 00 01 00 00 00  17 0b 59 33 a9 86 4c 57  |.........Y3..LW|
00000470  90 4a 1f cd a6 97 5e 78  00 00 00 00 00 00 00 00  |.J....^x........|
```

Group Descriptor

```
*
00000800  04 00 00 00 05 00 00 00  06 00 00 00 e1 01 31 00  |..............1.|
00000810  03 00 04 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000820  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
```

<u>Group descriptor at 2-2</u>
Block size   = 1024 * 2
             =2048
             =0x800

Inode Table

```
00001410   ff ff ff ff ff ff ff ff   ff ff ff ff ff ff ff ff   |................|
*
00001800   00 00 00 00 00 00 00 00   92 9f 81 51 92 9f 81 51   |...........Q...Q|
00001810   92 9f 81 51 00 00 00 00   00 00 00 00 00 00 00 00   |...Q............|
00001820   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00001880   ed 41 e8 03 00 04 00 00   67 a1 81 51 63 a1 81 51   |.A......g..Qc..Q|
00001890   63 a1 81 51 00 00 00 00   e8 03 04 00 02 00 00 00   |c..Q............|
000018a0   00 00 00 00 00 00 00 00   0e 00 00 00 00 00 00 00   |................|
000018b0   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00001b00   80 81 00 00 00 30 04 04   92 9f 81 51 92 9f 81 51   |.....0.....Q...Q|
00001b10   92 9f 81 51 00 00 00 00   00 00 01 00 04 00 00 00   |...Q............|
00001b20   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
```

Directory

```
*
00003800   02 00 00 00 0c 00 01 02   2e 00 00 00 02 00 00 00   |................|
00003810   0c 00 02 02 2e 2e 00 00   0b 00 00 00 14 00 0a 02   |................|
00003820   6c 6f 73 74 2b 66 6f 75   6e 64 00 00 0c 00 00 00   |lost+found......|
00003830   14 00 09 01 68 65 6c 6c   6f 2e 74 78 74 00 00 00   |....hello.txt...|
00003840   0d 00 00 00 14 00 09 02   73 75 62 66 6f 6c 64 65   |........subfolde|
00003850   72 00 00 00 0e 00 00 00   ac 03 0b 01 67 6f 6f 64   |r...........good|
00003860   62 79 65 2e 74 78 74 00   00 00 00 00 00 00 00 00   |bye.txt.........|
00003870   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00003c00   0b 00 00 00 0c 00 01 02   2e 00 00 00 02 00 00 00   |................|
```

Inode Table
Block 0x06
Block size = 1024 * 6
= 6144
= 0x1800

Directory
Block 0x0e
Block size = 1024 * 14
=14336
=0x3800

hello.txt
At inode 0x0c
= 0x1800 + (0x80 * 0x0b)
= 0x1d80

subfolder
At inode 0x0d
= 0x1800 + (0x80 * 0x0c)
= 0x1e00

goodbye.txt
At inode 0xe
= 0x1800 + (0x80 * 0x0d)
= 0x1e80

File inodes

```
*
00001d80  b4 81 e8 03 39 00 00 00   f1 a0 81 51 02 a1 81 51   |....9......Q...Q|
00001d90  02 a1 81 51 00 00 00 00   e8 03 01 00 02 00 00 00   |...Q............|
00001da0  00 00 00 00 00 00 00 00   1c 00 00 00 00 00 00 00   |................|
00001db0  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00001de0  00 00 00 00 6a 3c f4 19   00 00 00 00 00 00 00 00   |....j<..........|
00001df0  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
00001e00  fd 41 e8 03 00 04 00 00   62 a1 81 51 59 a1 81 51   |.A......b..QY..Q|
00001e10  59 a1 81 51 00 00 00 00   e8 03 02 00 02 00 00 00   |Y..Q............|
00001e20  00 00 00 00 00 00 00 00   1d 00 00 00 00 00 00 00   |................|
00001e30  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00001e60  00 00 00 00 6b 3c f4 19   00 00 00 00 00 00 00 00   |....k<..........|
00001e70  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
00001e80  b4 81 e8 03 4a 00 00 00   19 a1 81 51 63 a1 81 51   |....J......Qc..Q|
00001e90  2a a1 81 51 00 00 00 00   e8 03 02 00 02 00 00 00   |*..Q............|
00001ea0  00 00 00 00 00 00 00 00   1e 00 00 00 00 00 00 00   |................|
00001eb0  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00001ee0  00 00 00 00 6c 3c f4 19   00 00 00 00 00 00 00 00   |....l<..........|
```

hello.txt
Data block at 0x1c
        = 0x400 * 0x1c
        = 0x7000

subfolder
Data block at 0x1d
        = 0x400 * 0x1d
        = 0x7400

goodbye.txt
Data block at 0x1e
        = 0x400 * 0x1e
        = 0x7800

File Data

```
00000e10  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00007000  68 65 6c 6c 6f 20 74 68   65 72 65 0a 74 68 69 73   |hello there.this|
00007010  20 69 73 20 61 20 6e 6f   6e 20 65 6d 70 74 79 20   | is a non empty |
00007020  74 65 78 74 20 66 69 6c   65 2e 0a 68 6f 77 20 61   |text file..how a|
00007030  62 6f 75 74 20 74 68 61   74 00 00 00 00 00 00 00   |bout that.......|
00007040  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00007400  0d 00 00 00 0c 00 01 02   2e 00 00 00 02 00 00 00   |................|
00007410  0c 00 02 02 2e 2e 00 00   0e 00 00 00 14 00 0b 01   |................|
00007420  67 6f 6f 64 62 79 65 2e   74 78 74 00 0f 00 00 00   |goodbye.txt.....|
00007430  d4 03 09 07 68 65 6c 6c   6f 2e 74 78 74 00 00 00   |....hello.txt...|
00007440  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
00007800  67 6f 6f 64 62 79 65 20   6e 6f 77 0a 74 68 69 73   |goodbye now.this|
00007810  20 61 6c 73 6f 20 69 73   20 61 20 6e 6f 6e 20 65   | also is a non e|
00007820  6d 70 74 79 20 74 65 78   74 20 66 69 6c 65 2e 0a   |mpty text file..|
00007830  62 75 74 20 79 6f 75 20   6b 6e 6f 77 20 74 68 61   |but you know tha|
00007840  74 20 61 6c 72 65 61 64   79 0a 00 00 00 00 00 00   |t already.......|
00007850  00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   |................|
*
```

goodbye.txt
Link inode: 0x0e
        =0x1e80
Data Block: 0x1e
        =0x7800

hello.txt
Link inode: 0x0f
        =0x1f00

hello.txt symbolic link inode

```
*
00001ee0  00 00 00 00 6c 3c f4 19  00 00 00 00 00 00 00 00  |....l<..........|
00001ef0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001f00  ff a1 e8 03 0c 00 00 00  59 a1 81 51 59 a1 81 51  |........Y..QY..Q|
00001f10  59 a1 81 51 00 00 00 00  e8 03 01 00 00 00 00 00  |Y..Q............|
00001f20  00 00 00 00 00 00 00 00  2e 2e 2f 68 65 6c 6c 6f  |........../hello|
00001f30  2e 74 78 74 00 00 00 00  00 00 00 00 00 00 00 00  |.txt............|
00001f40  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00001f60  00 00 00 00 6d 3c f4 19  00 00 00 00 00 00 00 00  |....m<..........|
00001f70  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
```

hello.txt
Encoded at inode: ../hello.txt