navigator

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1 FS DISK 1: Constants

[18]:

```
blocksize = 1024
blocks_per_group = 8192
inodes_per_group = 1832
inode_size = 128
bootsector = 1024
superblock_size = 1024
block_group_descriptor_size = 1024
block_bitmap_size = 1024
inode_bitmap_size = 1024
number_of_groups = 7
inode_table_size = inode_size*inodes_per_group
```

2 Positions of Blocks of Interest

[5]:

```
def superblock_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize)

def blockGroupDescriptor_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize
               +superblock_size)

def blockBitMap_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize
               +superblock_size
               +block_group_descriptor_size)

def inodeBitMap_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize
               +superblock_size
               +block_group_descriptor_size
               + block_bitmap_size)
```

```

def inodeTable_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize
               +superblock_size
               +block_group_descriptor_size
               +block_bitmap_size
               +inode_bitmap_size)

def datablock_positions(i):
    return hex(bootsector
               +(i-1)*blocks_per_group*blocksize
               +superblock_size
               +block_group_descriptor_size
               +block_bitmap_size
               +inode_bitmap_size
               +inode_table_size)
```

3 Functions for inode searching

[16]:

```
def block_group_of_inode(inode):
    return (inode-1)//inodes_per_group

def index_of_inode(inode):
    return (inode-1)%inodes_per_group

def containing_block_of_inode(inode):
    return (index_of_inode(inode)*inode_size)//blocksize
```

3.1 Finding all blocks of interest

[8]:

```
supers = [superblock_positions(i+1) for i in range(number_of_groups)]
bgds = [blockGroupDescriptor_positions(i+1) for i in range(number_of_groups)]
bbms = [blockBitMap_positions(i+1) for i in range(number_of_groups)]
ibms = [inodeBitMap_positions(i+1) for i in range(number_of_groups)]
its= [inodeTable_positions(i+1) for i in range(number_of_groups)]
dbs = [datablock_positions(i+1) for i in range(number_of_groups)]
```

3.2 Printing blocks of interest for easy navigation

[85]:

```
for index,superblock in enumerate(supers):
    print(f'Group {index}')
    print(f'Superblock in position {superblock}')
    print(f'Block Group Descriptor in position {bgds[index]}')
    print(f'Block Bitmap in position {bbms[index]}')
    print(f'Inode Bitmap in position {ibms[index]}')
    print(f'Inode Table in position {its[index]}')
    print(f'Data Blocks in position {bds[index]}')
    print('====================================')
```

```
Group 0
Superblock in position 0x400
Block Group Descriptor in position 0x800
Block Bitmap in position 0xc00
Inode Bitmap in position 0x1000
Inode Table in position 0x1400
Data Blocks in position 0x3a800
====================================
Group 1
Superblock in position 0x800400
Block Group Descriptor in position 0x800800
Block Bitmap in position 0x800c00
Inode Bitmap in position 0x801000
Inode Table in position 0x801400
Data Blocks in position 0x83a800
====================================
Group 2
Superblock in position 0x1000400
Block Group Descriptor in position 0x1000800
Block Bitmap in position 0x1000c00
Inode Bitmap in position 0x1001000
Inode Table in position 0x1001400
Data Blocks in position 0x103a800
====================================
Group 3
Superblock in position 0x1800400
Block Group Descriptor in position 0x1800800
Block Bitmap in position 0x1800c00
Inode Bitmap in position 0x1801000
Inode Table in position 0x1801400
Data Blocks in position 0x183a800
====================================
Group 4
Superblock in position 0x2000400
Block Group Descriptor in position 0x2000800
Block Bitmap in position 0x2000c00
Inode Bitmap in position 0x2001000
Inode Table in position 0x2001400
Data Blocks in position 0x203a800
====================================
Group 5
Superblock in position 0x2800400
Block Group Descriptor in position 0x2800800
Block Bitmap in position 0x2800c00
```

```
Inode Bitmap in position 0x2801000
Inode Table in position 0x2801400
Data Blocks in position 0x283a800
====================================
Group 6
Superblock in position 0x3000400
Block Group Descriptor in position 0x3000800
Block Bitmap in position 0x3000c00
Inode Bitmap in position 0x3001000
Inode Table in position 0x3001400
Data Blocks in position 0x303a800
====================================
```

4 FS DISK 3: Constants:

[9]:

```python
blocksize = 1024
blocks_per_group = 8192
inodes_per_group = 1712
inode_size = 128
bootsector = 1024
superblock_size = 1024
block_group_descriptor_size = 1024
block_bitmap_size = 1024
inode_bitmap_size = 1024
number_of_groups = 3
inode_table_size = inode_size*inodes_per_group
```

4.1 Finding all blocks of interest

[10]:

```python
supers3 = [superblock_positions(i+1) for i in range(number_of_groups)]
bgds3 = [blockGroupDescriptor_positions(i+1) for i in range(number_of_groups)]
bbms3 = [blockBitMap_positions(i+1) for i in range(number_of_groups)]
ibms3 = [inodeBitMap_positions(i+1) for i in range(number_of_groups)]
its3 = [inodeTable_positions(i+1) for i in range(number_of_groups)]
dbs3 = [datablock_positions(i+1) for i in range(number_of_groups)]
```

4.2 Printing blocks of interest for easy navigation

[13]:

```python
for index,superblock in enumerate(supers3):
    print(f'Group {index}')
    print(f'Superblock in position {superblock}')
    print(f'Block Group Descriptor in position {bgds3[index]}')
    print(f'Block Bitmap in position {bbms3[index]}')
    print(f'Inode Bitmap in position {ibms3[index]}')
    print(f'Inode Table in position {its3[index]}')
    print(f'Data Blocks in position {dbs3[index]}')
    print('====================================')
```

```
Group 0
Superblock in position 0x400
Block Group Descriptor in position 0x800
Block Bitmap in position 0xc00
Inode Bitmap in position 0x1000
Inode Table in position 0x1400
Data Blocks in position 0x36c00
====================================
Group 1
Superblock in position 0x800400
Block Group Descriptor in position 0x800800
Block Bitmap in position 0x800c00
Inode Bitmap in position 0x801000
Inode Table in position 0x801400
Data Blocks in position 0x836c00
====================================
Group 2
Superblock in position 0x1000400
Block Group Descriptor in position 0x1000800
Block Bitmap in position 0x1000c00
Inode Bitmap in position 0x1001000
Inode Table in position 0x1001400
Data Blocks in position 0x1036c00
====================================
```