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CprE 308 Sec 2

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Lab 7 – Lab Report

This lab was one of the most interesting labs in this whole class, as it gave me the opportunity to gain the hands-on experience with the FAT-12 file system, which is something I had previously never worked on before. I learned how to decode the boot sector by hand, and then wrote a program which decoded the boot sector automatically. This allowed me to see the different factors of the boot sector, as well as the root directories values. It further allowed me to decode “image” and find out the information stored in its boot sector.

3.1 / 3.2: Boot Sector Layout (Exercise 1) The initial values were as below:

	Hex	**Decimal**
Bytes per logical sector	0x0200	512
Logical Sectors per cluster (block)	0x10	16
Max number of root directory entries	0x00E0	224
Logical sectors per FAT	0x0001	1

For the second part of the lab, I learned to write a program to perform the ls function on a FAT-12 file system, “image”, which is one of a series of file systems based around the concept of a File Allocation Table (FAT). I learned how to decode a root directory and view each of the files, which for this case, is a 32-bit string of data which can extract information. The portion where we had to print out the information of all the valid root directory entries confused me a lot, as it took me a lot of time to figure out the way to construct the statements, that would accurately print out the correct answer. I was able to print out the right values for the time, date, and size only when I included the endianSwap method. But overall, this was an extremely useful and interesting lab, which helped me to gain a lot of knowledge.

3.3 Exercise 2:

```
bash-4.2$ gcc -o bsdump bsdump-template.c && ./bsdump image
                    Name:   mkdosfs
             Bytes/Sector:   512
          Sectors/Cluster:   16
         Reserved Sectors:   1
           Number of FATs:   2
  Root Directory entries:   224
          Logical sectors:   2880
        Medium descriptor:   0x00f0
              Sectors/FAT:   1
            Sectors/Track:   18
          Number of heads:   2
Number of Hidden Sectors:   0
```

4.2 Exercise 3:

```
bash-4.2$ ./fat12ls image
root dir offset: 1536
max # root dir entries: 224
Filename        Attrib  Time            Date            Size
16SEC.TXT       RHS     10:30:50        2002/11/06      331
1SEC.TXT        RH      10:28:54        2002/03/08      331
2SEC.TXT        R       06:19:32        2002/02/01      332
4SEC.TXT        H       10:28:10        2005/12/30      331
8SEC.TXT        A       09:11:58        1981/01/02      331
BIG.LOG         HS      00:00:58        2009/05/03      62559
(R)ead Only (H)idden (S)ystem (A)rchive
bash-4.2$
```