

File System Project – Milestone 1

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1. A dump (use the provided HexDump utility) of the volume file that shows the VCB, FreeSpace, and complete root directory.

- The Volume Control Block (LBA[0])
- **4C4B** in decimal is the numBlocks variable which equate to 19531
- **0200** is the blockSize variable which is equivalent to 512
- **01** is the locOfFreespace variable with a value of 1
- **06** is the locOfRoot variable with the value of 6.
- **1F 21 F0 20 C9** is the signature (magic number) in little-endian, which equals 133713371337 in decimal form.

```

000200: 4B 4C 00 00 00 02 00 00 01 00 00 00 06 00 00 00 | KL.....
000210: C9 20 F0 21 1F 00 00 00 00 00 00 00 00 00 00 | É ð!.....
000220: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000230: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000240: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000250: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000260: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000270: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000280: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000290: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0002A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0002B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0002C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0002D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0002E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....

```

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000300: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000310: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000320: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000330: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000340: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000350: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000360: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000370: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000380: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
000390: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....
0003F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....

```

- ```
000400: FF FF FF FF 07 00 00 00 00 00 00 00 00 00 00 00 | ÿÿÿÿ.....
000410: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000420: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```



```

0005A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0005B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0005C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0005D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0005E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0005F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

```

// root directory

- 2E is the "." the name of the first DE
- 2E 2E is the ".." the name of the second DE
- 3840 is 14400 which is the size of the root directory (variable in both DEs)
- 06 is the location of the root directory (variable in both DEs)

```

000E00: 2E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000E90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000EA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000EB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000EC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000ED0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000EE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000EF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

000F00: 40 38 00 00 00 00 00 00 00 00 00 00 00 00 00 | @8.....
000F10: 00 00 00 00 00 00 00 00 00 00 06 00 00 00 00 |
000F20: 2E 2E 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000F90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000FA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

```

```

000FB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000FC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000FD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000FE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
000FF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

```

```
001100: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001110: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001120: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001140: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001150: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001170: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001180: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001190: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0011F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```

```
0012E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0012F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```

```
001400: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001410: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001420: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001430: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001440: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001450: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001460: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001470: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001480: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001490: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0014F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```





```
001930: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001940: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001950: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001960: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001970: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001980: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001990: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0019F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```

```

001C60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001C70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001C80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001C90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
001CF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

```









```
002C40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002C50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002C60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002C70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002C80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002C90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
002CF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```





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0032A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0032B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0032C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0032D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0032E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0032F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
```



003900: 00 00 00 00 00 00 00 00 F4 C8 A9 FC 25 7F 00 00 | .....F4e\FC%..  
003910: 00 00 00 00 00 00 00 00 F0 FE C9 FC 25 7F 00 00 | .....F0\FE\C9\FC%..  
003920: 04 00 00 00 00 00 00 00 0F 61 A9 FC 25 7F 00 00 | .....a\A9\FC%..  
003930: F0 59 CB FC 25 7F 00 00 20 04 CA FC 25 7F 00 00 | \F0Y\CB\FC%.. \CA\FC%..  
003940: B0 51 D7 AC FF 7F 00 00 F0 B6 A8 FC 25 7F 00 00 | \B0Q \FF..\F0\B6\A8\FC%..  
003950: A5 96 0A 01 00 00 00 00 72 73 EA FB 25 7F 00 00 | \A5\96.....rs\EA\FB%..  
003960: A0 7F E9 FB 25 7F 00 00 F4 C8 A9 FC 25 7F 00 00 | \A0\E9\FB%..F4e\FC%..  
003970: 05 00 00 00 25 7F 00 00 F0 FE C9 FC 25 7F 00 00 | ....%\F0\FE\C9\FC%..  
003980: 04 00 00 00 00 00 00 00 0F 61 A9 FC 25 7F 00 00 | .....a\A9\FC%..  
003990: F0 59 CB FC 25 7F 00 00 00 00 00 00 00 00 00 | \F0Y\CB\FC%.....  
0039A0: 10 0A CA FC 25 7F 00 00 F0 B6 A8 FC 25 7F 00 00 | ..\CA\FC%..\F0\B6\A8\FC%..  
0039B0: D7 F6 16 02 00 00 00 00 DA 74 EA FB 25 7F 00 00 | \D7\F6.....\DAt\EA\FB%..  
0039C0: 88 7F E9 FB 25 7F 00 00 38 B3 A8 FC 25 7F 00 00 | \88\E9\FB%..8\B3\A8\FC%..  
0039D0: 05 00 00 00 25 7F 00 00 00 00 00 00 FF 7F 00 00 | ....%\FF..  
0039E0: 00 50 D7 AC FF 7F 00 00 03 00 00 00 25 7F 00 00 | .P \FF.....%..  
0039F0: 70 50 D7 AC FF 7F 00 00 00 00 00 00 25 7F 00 00 | pP \FF.....%..  
  
003A00: 10 0A CA FC 25 7F 00 00 00 00 00 00 00 00 00 | ..\CA\FC%.....  
003A10: 07 00 00 00 00 00 00 00 F0 59 CB FC 25 7F 00 00 | .....F0Y\CB\FC%..  
003A20: 01 00 00 00 00 00 00 00 EF B5 BD 85 00 00 00 00 | .....85فخما....  
003A30: 48 02 CA FC 25 7F 00 00 18 51 D7 AC FF 7F 00 00 | H.\CA\FC%...Q \FF..  
003A40: D0 D2 C9 FC 25 7F 00 00 F0 FE C9 FC 25 7F 00 00 | \D0\D2\C9\FC%..\F0\FE\C9\FC%..  
003A50: 00 00 00 00 00 00 00 00 9F 63 A9 FC 25 7F 00 00 | .....9F\A9\FC%..  
003A60: 05 00 00 00 00 00 00 00 D0 D2 C9 FC 25 7F 00 00 | .....D0\D2\C9\FC%..  
003A70: 01 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003A80: 01 00 00 00 00 00 00 00 F0 FE C9 FC 25 7F 00 00 | .....F0\FE\C9\FC%..  
003A90: DA 74 EA FB 25 7F 00 00 00 00 00 00 01 00 00 00 | \DAt\EA\FB%.....  
003AA0: 70 50 D7 AC FF 7F 00 00 80 50 D7 AC FF 7F 00 00 | pP \FF..\80P \FF..  
003AB0: 48 02 CA FC 25 7F 00 00 00 00 00 00 00 00 00 | H.\CA\FC%.....  
003AC0: A0 F1 FF 7F 03 00 00 00 F8 F0 27 FC 25 7F 00 00 | \A0\F1\FF...\F8\F0\FC%..  
003AD0: FF FF FF FF 00 00 00 00 00 00 00 00 00 00 00 | \FF\FF\FF\FF.....  
003AE0: B8 B5 A8 FC 25 7F 00 00 F0 59 CB FC 25 7F 00 00 | \B8\B5\A8\FC%..\F0Y\CB\FC%..  
003AF0: 60 50 CB FC 25 7F 00 00 53 B0 A9 FC 25 7F 00 00 | `P\CB\FC%...S\B0\A9\FC%..  
  
003B00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003B10: 50 52 D7 AC FF 7F 00 00 28 B5 A8 FC 25 7F 00 00 | PR \FF..(\B5\A8\FC%..  
003B20: 10 53 D7 AC FF 7F 00 00 A0 F0 27 FC 25 7F 00 00 | .S \FF..\A0\F0\FC%..  
003B30: 30 FC 27 FC 25 7F 00 00 68 0D 00 00 00 00 00 00 | 0\FC\FC%..h.....  
003B40: 08 E0 68 F7 3B 56 00 00 60 B7 27 FC 25 7F 00 00 | .E0h\F7;V..B7\FC%..  
003B50: 05 00 00 00 00 00 00 00 53 B0 A9 FC 25 7F 00 00 | .....S\B0\A9\FC%..  
003B60: 01 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003B70: 7F 03 00 00 00 00 00 00 B8 B5 A8 FC 25 7F 00 00 | .....B8\B5\A8\FC%..  
003B80: 70 53 D7 AC FF 7F 00 00 E3 27 AA FC 25 7F 00 00 | pS \FF..\E3\AA\FC%..  
003B90: A0 FC 27 FC 25 7F 00 00 60 04 28 FC 25 7F 00 00 | \A0\FC\FC%...`.\FC%..  
003BA0: 10 4D F2 FB 25 7F 00 00 A8 53 D7 AC FF 7F 00 00 | .M\F2\FB%..\A8S \FF..  
003BB0: 15 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003BC0: D0 11 F5 FB 25 7F 00 00 00 00 00 00 00 00 00 | \D0.\F5\FB%.....  
003BD0: 7F 03 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003BE0: 00 00 00 00 00 00 00 00 80 1F 00 00 FF FF 00 00 | .....80...\FF\FF..  
003BF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
  
003C00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
003C10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....

```

003C20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003C30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003C40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003C50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003C60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003C70: 80 04 28 FC 25 7F 00 00 80 04 28 FC 25 7F 00 00 | \80.\(FC%...\80.\(FC%...
003C80: 40 04 28 FC 25 7F 00 00 40 04 28 FC 25 7F 00 00 | @.\(FC%...@.\(FC%...
003C90: 7D 00 00 00 7E 00 00 00 7F 00 00 00 80 00 00 00 | }...~...80...
003CA0: 30 FC 27 FC 25 7F 00 00 30 FC 27 FC 25 7F 00 00 | 0\FC\FC%...0\FC\FC%...
003CB0: 0E 00 00 00 00 00 00 00 0E 00 00 00 00 00 00 00 |
003CC0: 00 00 00 00 00 00 00 00 D1 A1 FA FB 25 7F 00 00 |w\FA\FB%...
003CD0: 40 FC 27 FC 25 7F 00 00 50 02 00 00 00 00 00 00 | @\FC\FC%...P.....
003CE0: 00 00 00 00 00 00 00 00 B9 F1 F2 FB 25 7F 00 00 |B9\F1\F2\FB%...
003CF0: 20 04 28 FC 25 7F 00 00 98 80 F2 FB 25 7F 00 00 | .\FC%...\98\80\F2\FB%...

003D00: 00 00 00 00 00 00 00 00 00 F0 5E F9 3B 56 00 00 |F0^F9;V..
003D10: 70 02 00 00 00 00 00 00 00 10 02 00 00 00 00 00 | p.....
003D20: 00 F0 FF FF FF FF FF FF 00 00 00 00 00 00 00 00 | \F0\FF\FF\FF\FF\FF\FF.....
003D30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003D40: 00 00 00 00 00 00 00 00 50 02 00 00 00 00 00 00 |P.....
003D50: B0 FF FF FF FF FF FF FF 23 00 00 00 00 00 00 00 | \B0\FF\FF\FF\FF\FF\FF\FF#.....
003D60: A0 FC 27 FC 25 7F 00 00 40 FC 27 FC 25 7F 00 00 | \A0\FC\FC%...@FC\FC%...
003D70: 00 00 00 00 00 00 00 00 60 90 F2 FB 25 7F 00 00 |`90\F2\FB%...
003D80: B0 53 D7 AC FF 7F 00 00 40 02 00 00 00 00 00 00 | \B0S \FF...@.....
003D90: 10 02 00 00 25 00 00 00 00 04 00 00 00 00 00 00 | ...%.
003DA0: 00 00 00 00 40 00 00 00 07 00 00 00 00 00 00 00 | ...@.....
003DB0: 10 04 00 00 00 00 00 00 08 F2 5E F9 3B 56 00 00 |F2^F9;V..
003DC0: 30 04 00 00 00 00 00 00 B0 FF FF FF FF FF FF FF | 0.....\B0\FF\FF\FF\FF\FF\FF\FF
003DD0: 10 00 00 00 00 00 00 00 41 00 00 00 40 00 00 00 |A...@...
003DE0: 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
003DF0: 00 00 00 00 00 00 00 00 7C 00 00 00 77 00 00 00 ||...w...

003E00: 6E 00 00 00 5D 00 00 00 40 FC 27 FC 25 7F 00 00 | n...]\FC\FC%...
003E10: B0 FF FF FF FF FF FF FF 00 04 00 00 00 00 00 00 | \B0\FF\FF\FF\FF\FF\FF\FF.....
003E20: B0 FF FF FF FF FF FF FF 68 0D 00 00 00 00 00 00 | \B0\FF\FF\FF\FF\FF\FF\FFh.....
003E30: 08 E0 68 F7 3B 56 00 00 60 B7 27 FC 25 7F 00 00 | \E0h\F7;V..`B7\FC%...
003E40: 05 00 00 00 00 00 00 00 91 AA F2 FB 25 7F 00 00 |91\AA\F2\FB%...
003E50: D0 5B 02 00 00 00 00 00 3F 00 00 00 00 00 00 00 | \D0[.....?.....
003E60: 00 5B 22 00 00 00 00 00 00 04 00 00 00 00 00 00 | [.".....
003E70: 00 04 00 00 00 00 00 00 5A 21 F1 FB 25 7F 00 00 |Z\F1\FB%...
003E80: 17 00 00 00 00 00 00 00 03 00 00 00 00 00 00 00 |
003E90: 01 00 00 00 00 00 00 00 90 21 00 00 E8 03 00 00 |90!\E8...
003EA0: 05 00 00 00 00 00 00 00 00 88 00 00 00 00 00 00 |88.....
003EB0: 00 00 00 00 00 00 00 00 00 04 00 00 00 00 00 00 |
003EC0: 00 00 00 00 00 00 00 00 26 D4 5A 63 00 00 00 00 |&\D4Zc....
003ED0: BE 5D AD 2F 00 00 00 00 26 D4 5A 63 00 00 00 00 | \BE\AD/....&\D4Zc....
003EE0: BE 5D AD 2F 00 00 00 00 15 CF 5A 63 00 00 00 00 | \BE\AD/....\CFZc....
003EF0: BE 5D AD 2F 00 00 00 00 00 00 00 00 00 00 00 00 | \BE\AD/.....

003F00: 00 00 00 00 00 00 00 00 5D F1 F1 FB 25 7F 00 00 |]\F1\F1\FB%...
003F10: 0D E0 68 F7 3B 56 00 00 60 07 28 FC 25 7F 00 00 | \E0h\F7;V..`.\FC%...
003F20: 68 0D 00 00 00 00 00 00 28 00 00 00 00 00 00 00 | h.....(.....
003F30: 60 F2 5E F9 3B 56 00 00 5D F1 F1 FB 25 7F 00 00 | \F2^F9;V..]\F1\F1\FB%...
003F40: 60 07 28 FC 25 7F 00 00 60 07 28 FC 25 7F 00 00 | `.\FC%...`.\FC%...

```

003F50: 68 0D 00 00 00 00 00 00 1D 00 00 00 00 00 00 00 | h.....  
 003F60: 60 F2 5E F9 3B 56 00 00 01 0F F2 FB 25 7F 00 00 | \F2^F9;V...F2\FB%..  
 003F70: 00 00 00 00 00 00 00 00 60 07 28 FC 25 7F 00 00 | .....`.\(FC%..  
 003F80: 00 00 00 00 00 00 00 00 68 0D 00 00 00 00 00 00 | .....h.....  
 003F90: 72 DF 68 F7 3B 56 00 00 60 B7 27 FC 25 7F 00 00 | \DFh\F7;V..B7\FC%..  
 003FA0: 00 00 00 00 00 00 00 00 8D F9 F1 FB 25 7F 00 00 | .....8D\F9\F1\FB%..  
 003FB0: 27 00 00 00 00 00 00 00 60 07 28 FC 25 7F 00 00 | '.....`.\(FC%..  
 003FC0: 01 00 00 00 00 00 00 00 5E DF 68 F7 3B 56 00 00 | .....^DFh\F7;V..  
 003FD0: 10 5B D7 AC FF 7F 00 00 20 5B D7 AC FF 7F 00 00 | .[ \FF. [ \FF..  
 003FE0: 1C 00 00 00 00 00 00 00 60 07 28 FC 25 7F 00 00 | .....`.\(FC%..  
 003FF0: 01 00 00 00 00 00 00 00 56 F5 EE FB 25 7F 00 00 | .....V\F5\EE\FB%..  
  
 004000: FF FF FF FF FF FF FF FF 00 00 00 00 3B 56 00 00 | \FF\FF\FF\FF\FF\FF\FF\FF....;V..  
 004010: 70 DF 68 F7 3B 56 00 00 00 00 00 00 FF 7F 00 00 | p\DFh\F7;V.....\FF..  
 004020: 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 | .....  
 004030: FF FF FF FF FF FF FF FF 00 00 00 00 01 00 00 00 | \FF\FF\FF\FF\FF\FF\FF\FF.....  
 004040: 0A 00 00 00 3B 56 00 00 CC 5A D7 AC FF 7F 00 00 | ....;V..CCZ \FF..  
 004050: 00 00 00 00 3B 56 00 00 C9 20 F0 21 1F 00 00 00 | ....;V..C9\F0!....  
 004060: 0C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004070: 00 00 00 00 FF FF FF FF 00 00 00 00 04 00 00 00 | ....\FF\FF\FF\FF.....  
 004080: F0 56 D7 AC FF 7F 00 00 20 5B D7 AC FF 7F 00 00 | \F0V \FF. [ \FF..  
 004090: 70 DF 68 F7 3B 56 00 00 00 00 00 00 00 00 00 00 | p\DFh\F7;V.....  
 0040A0: 00 0D 00 00 00 00 00 00 72 DF 68 F7 3B 56 00 00 | .....^DFh\F7;V..  
 0040B0: 6E DF 68 F7 3B 56 00 00 00 00 00 00 01 00 00 00 | n\DFh\F7;V.....  
 0040C0: 30 57 D7 AC FF 7F 00 00 20 00 00 00 3B 56 00 00 | 0W \FF. ....;V..  
 0040D0: 78 DE 68 F7 3B 56 00 00 00 00 00 00 00 00 00 00 | x\DEh\F7;V.....  
 0040E0: 68 0D 00 00 00 00 00 00 7A DE 68 F7 3B 56 00 00 | h.....z\DEh\F7;V..  
 0040F0: 47 DE 68 F7 3B 56 00 00 00 00 00 00 01 00 00 00 | G\DEh\F7;V.....  
  
 004100: 30 79 29 FC 25 7F 00 00 60 07 28 FC 25 7F 00 00 | 0y)\FC%..<`.\(FC%..  
 004110: 00 00 00 00 FF 7F 00 00 00 00 00 00 00 00 00 00 | ....\FF.....  
 004120: 8F D7 4A FC 25 7F 00 00 08 00 00 00 30 00 00 00 | \8F\D7J\FC%.....0...  
 004130: 00 5C D7 AC FF 7F 00 00 40 5B D7 AC FF 7F 00 00 | \ \FF. @ [ \FF..  
 004140: 30 79 29 FC 25 7F 00 00 60 07 28 FC 25 7F 00 00 | 0y)\FC%..<`.\(FC%..  
 004150: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004160: 10 67 CB FC 25 7F 00 00 08 00 00 00 30 00 00 00 | .g\CB\FC%.....0...  
 004170: 40 5C D7 AC FF 7F 00 00 80 5B D7 AC FF 7F 00 00 | @ \ \FF. \80 [ \FF..  
 004180: 38 7A 08 02 00 00 00 00 B6 90 04 FC 25 7F 00 00 | 8z.....B6\90.\FC%..  
 004190: F0 58 D7 AC FF 7F 00 00 88 E1 DE AC FF 7F 00 00 | \F0X \FF. \88\E1\FF..  
 0041A0: 02 00 00 00 25 7F 00 00 F4 C8 A9 FC 25 7F 00 00 | ....%..\F4\FC%..  
 0041B0: 50 58 D7 AC FF 7F 00 00 70 61 CB FC 25 7F 00 00 | PX \FF. pa\CB\FC%..  
 0041C0: 00 00 00 00 00 00 00 00 0F 61 A9 FC 25 7F 00 00 | .....a\A9\FC%..  
 0041D0: F0 FE C9 FC 25 7F 00 00 00 00 00 00 00 00 00 00 | \F0\FE\C9\FC%.....  
 0041E0: 01 00 00 00 00 00 00 00 28 5A EA FB 25 7F 00 00 | .....(Z\EA\FB%..  
 0041F0: 69 FE 9D 01 00 00 00 00 C1 B8 A8 FC 25 7F 00 00 | \FE\9D.....C1\B8\A8\FC%..  
  
 004200: 80 B4 A8 FC 25 7F 00 00 F4 C8 A9 FC 25 7F 00 00 | \80\B4\A8\FC%..\F4\FC%..  
 004210: 1D 00 00 00 25 7F 00 00 00 FA C9 FC 25 7F 00 00 | ....%..\FA\C9\FC%..  
 004220: 03 00 00 00 00 00 00 00 0F 61 A9 FC 25 7F 00 00 | .....a\A9\FC%..  
 004230: F0 FE C9 FC 25 7F 00 00 00 00 00 00 FF 7F 00 00 | \F0\FE\C9\FC%.....\FF..  
 004240: 10 0A CA FC 25 7F 00 00 28 5A EA FB 25 7F 00 00 | ..\CA\FC%...(Z\EA\FB%..  
 004250: 84 BF C4 02 00 00 00 00 06 80 28 FC 25 7F 00 00 | \84\BF\C4.....\80\FC%..  
 004260: B8 64 28 FC 25 7F 00 00 6C 5A E9 FB 25 7F 00 00 | \B8d\FC%..\Z\E9\FB%..  
 004270: 1D 00 00 00 25 7F 00 00 00 00 00 00 FF 7F 00 00 | ....%.....\FF..

004280: 20 59 D7 AC FF 7F 00 00 03 00 00 00 25 7F 00 00 | Y \FF.....%  
 004290: 10 59 D7 AC FF 7F 00 00 00 00 00 00 25 7F 00 00 | .Y \FF.....%  
 0042A0: 10 0A CA FC 25 7F 00 00 00 00 00 00 00 00 00 | ..\CA\FC%  
 0042B0: 07 00 00 00 00 00 00 00 F0 FE C9 FC 25 7F 00 00 | .....F0\FE\C9\FC%  
 0042C0: 01 00 00 00 00 00 00 00 17 E1 2F B1 00 00 00 00 | .....E1\B1....  
 0042D0: 58 FD C9 FC 25 7F 00 00 F4 C8 A9 FC 25 7F 00 00 | X\FD\C9\FC%..\F4\FC%  
 0042E0: 00 0E CA FC 25 7F 00 00 F0 FE C9 FC 25 7F 00 00 | ..\CA\FC%..\F0\FE\C9\FC%  
 0042F0: 04 00 00 00 00 00 00 00 0F 61 A9 FC 25 7F 00 00 | .....a\A9\FC%  
  
 004300: F0 59 CB FC 25 7F 00 00 D0 0E CA FC 25 7F 00 00 | \F0Y\CB\FC%..\D0.\CA\FC%  
 004310: 01 00 00 00 00 00 00 00 F0 B6 A8 FC 25 7F 00 00 | .....F0\B6\A8\FC%  
 004320: D7 F6 16 02 00 00 00 00 BE 92 28 FC 25 7F 00 00 | \D7\F6.....\BE\92\FC%  
 004330: 38 66 28 FC 25 7F 00 00 38 B3 A8 FC 25 7F 00 00 | 8f\FC%..8\B3\A8\FC%  
 004340: 05 00 00 00 25 7F 00 00 00 00 00 00 FF 7F 00 00 | ....%.....\FF  
 004350: F0 59 D7 AC FF 7F 00 00 03 00 00 00 00 00 00 00 | \F0Y \FF.....  
 004360: E0 59 D7 AC FF 7F 00 00 00 00 00 00 25 7F 00 00 | \E0Y \FF.....%  
 004370: 10 0A CA FC 25 7F 00 00 00 00 00 00 00 00 00 00 | ..\CA\FC%  
 004380: 07 00 00 00 00 00 00 00 F0 59 CB FC 25 7F 00 00 | .....F0Y\CB\FC%  
 004390: 07 00 00 00 08 00 00 00 EF B5 BD 85 00 00 00 00 | .....85فخما....  
 0043A0: 58 FD C9 FC 25 7F 00 00 88 5A D7 AC FF 7F 00 00 | X\FD\C9\FC%..\88Z \FF  
 0043B0: 30 0F CA FC 25 7F 00 00 00 FA C9 FC 25 7F 00 00 | 0.\CA\FC%..\FA\C9\FC%  
 0043C0: 00 00 00 00 00 00 00 00 9F 63 A9 FC 25 7F 00 00 | .....9F\A9\FC%  
 0043D0: 05 00 00 00 00 00 00 00 30 0F CA FC 25 7F 00 00 | .....0.\CA\FC%  
 0043E0: 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0043F0: 01 00 00 00 00 00 00 00 00 FA C9 FC 25 7F 00 00 | .....FA\C9\FC%  
  
 004400: 00 92 28 FC 25 7F 00 00 00 00 00 00 01 00 00 00 | ..\92\FC%  
 004410: E0 59 D7 AC FF 7F 00 00 F0 59 D7 AC FF 7F 00 00 | \E0Y \FF..\F0Y \FF  
 004420: 58 FD C9 FC 25 7F 00 00 00 00 00 00 00 00 00 00 | X\FD\C9\FC%  
 004430: 40 C1 28 FC 25 7F 00 00 00 F0 FF FF FF FF FF FF | @\C1\FC%..\F0\FF\FF\FF\FF\FF\FF  
 004440: FF FF FF FF 00 00 00 00 60 B8 28 FC 25 7F 00 00 | \FF\FF\FF\FF....\B8\FC%  
 004450: B8 B5 A8 FC 25 7F 00 00 F0 59 CB FC 25 7F 00 00 | \B8\B5\A8\FC%..\F0Y\CB\FC%  
 004460: C1 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | \C1.....  
 004470: 7F 03 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004480: 00 00 00 00 00 00 00 00 80 1F 00 00 FF FF 00 00 | .....80...\FF\FF..  
 004490: 00 00 00 00 00 00 00 00 38 F2 49 FC 25 7F 00 00 | .....8\F2\FC%  
 0044A0: 04 00 00 00 00 00 00 00 78 5D D7 AC FF 7F 00 00 | .....x] \FF  
 0044B0: A0 5D D7 AC FF 7F 00 00 00 00 00 00 00 00 00 00 | \A0] \FF.....  
 0044C0: 70 61 CB FC 25 7F 00 00 53 B0 A9 FC 25 7F 00 00 | pa\CB\FC%..\S\B0\A9\FC%  
 0044D0: 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0044E0: 00 00 00 00 00 00 00 00 B8 B5 A8 FC 25 7F 00 00 | .....B8\B5\A8\FC%  
 0044F0: E0 5C D7 AC FF 7F 00 00 E3 27 AA FC 25 7F 00 00 | \E0\ \FF..\E3\AA\FC%  
  
 004500: 00 00 00 00 00 00 00 30 00 EF AF 8A 98 B7 55 28 | .....0.98\ \B7U(  
 004510: 10 67 CB FC 25 7F 00 00 00 00 00 00 00 00 00 00 | .g\CB\FC%  
 004520: 00 C2 68 F7 3B 56 00 00 70 5D D7 AC 31 33 33 37 | \C2h\F7;V..p]1337  
 004530: 31 33 33 37 31 33 33 37 00 EF AF 8A 98 B7 55 28 | 13371337.98\ \B7U(  
 004540: 30 5C D7 AC FF 7F 00 00 00 0A 00 00 00 00 00 00 | 0\ \FF.....  
 004550: 90 C2 68 F7 58 00 00 00 07 00 00 00 00 00 00 00 | \90\C2h\F7X.....  
 004560: 10 00 00 00 00 00 00 00 60 5B D7 AC FF 7F 00 00 | .....[ \FF  
 004570: 20 5B D7 AC FF 7F 00 00 00 EF AF 8A 98 B7 55 28 | [ \FF...98\ \B7U(  
 004580: 28 00 00 00 00 00 00 00 A1 00 00 00 58 00 00 00 | (.....A1...X..  
 004590: 90 5B D7 AC FF 7F 00 00 40 FC 27 FC 25 7F 00 00 | \90[ \FF...@\FC\FC%  
 0045A0: 01 00 00 00 00 00 00 00 30 F9 5E F9 3B 56 00 00 | .....0\F9\F9;V..

0045B0: 20 F9 5E F9 3B 56 00 00 3D C3 F2 FB 25 7F 00 00 | \F9^F9;V..=\C3\F2\FB%..  
 0045C0: 40 E2 C9 FC 25 7F 00 00 01 00 00 00 00 00 00 | @\E2\C9\FC%.....  
 0045D0: 05 00 00 00 00 00 00 00 30 F9 5E F9 3B 56 00 00 | .....0\F9^F9;V..  
 0045E0: 70 5D D7 AC FF 7F 00 00 00 EF AF 8A 98 B7 55 28 | p] \FF...98\ \B7U(  
 0045F0: 02 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
  
 004600: F0 5B D7 AC FF 7F 00 00 90 C2 68 F7 3B 56 00 00 | \F0[ \FF...\90\C2h\F7;V..  
 004610: 70 5D D7 AC FF 7F 00 00 00 00 00 00 00 00 00 | p] \FF.....  
 004620: 00 00 00 00 00 00 00 00 0E CF 68 F7 3B 56 00 00 | .....CFh\F7;V..  
 004630: 00 02 00 00 00 00 00 00 00 0A 00 00 00 00 00 | .....  
 004640: 06 00 00 00 00 00 00 00 00 EF AF 8A 98 B7 55 28 | .....98\ \B7U(  
 004650: 30 5C D7 AC FF 7F 00 00 41 D0 68 F7 3B 56 00 00 | 0\ \FF...\A\D0h\F7;V..  
 004660: 00 02 00 00 00 00 00 00 4B 4C 00 00 00 00 00 | .....KL.....  
 004670: 70 F6 5E F9 3B 56 00 00 00 00 00 00 00 00 00 | p\F6^F9;V.....  
 004680: 00 0A 00 00 00 00 00 00 70 F6 5E F9 3B 56 00 00 | .....p\F6^F9;V..  
 004690: 90 5C D7 AC FF 7F 00 00 78 C9 68 F7 3B 56 00 00 | \90\ \FF...x\C9h\F7;V..  
 0046A0: 78 5D D7 AC FF 7F 00 00 F0 00 00 00 04 00 00 00 | x] \FF...\F0.....  
 0046B0: 01 00 00 00 00 00 00 00 00 96 98 00 00 00 00 | .....96\98.....  
 0046C0: 00 02 00 00 00 00 00 00 D0 71 D7 AC FF 7F 00 00 | .....D0q \FF..  
 0046D0: 50 DB 68 F7 3B 56 00 00 90 C2 68 F7 3B 56 00 00 | P\DBh\F7;V..\90\C2h\F7;V..  
 0046E0: 70 5D D7 AC FF 7F 00 00 00 EF AF 8A 98 B7 55 28 | p] \FF...98\ \B7U(  
 0046F0: 50 DB 68 F7 3B 56 00 00 87 5C EB FB 25 7F 00 00 | P\DBh\F7;V..\87\EB\FB%..  
  
 004700: 04 00 00 00 00 00 00 00 78 5D D7 AC FF 7F 00 00 | .....x] \FF..  
 004710: 00 C0 00 00 04 00 00 00 7B C8 68 F7 3B 56 00 00 | \C0.....\C8h\F7;V..  
 004720: 00 00 00 00 00 00 00 00 66 8A 51 E2 AB A7 AE CA | .....f8AQ=A\AE\CA  
 004730: 90 C2 68 F7 3B 56 00 00 70 5D D7 AC FF 7F 00 00 | \90\C2h\F7;V..p] \FF..  
 004740: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004750: 66 8A B1 ED D4 10 26 99 66 8A 8F EC AC BE 92 98 | f8A\B1\ED\D4.&\99f8A\8F 92\98  
 004760: 00 00 00 00 FF 7F 00 00 00 00 00 00 00 00 00 | ...FF.....  
 004770: 00 00 00 00 00 00 00 00 D3 B8 A9 FC 25 7F 00 00 | .....B\A9\FC%..  
 004780: 88 9D A8 FC 25 7F 00 00 B0 EB 49 FC 25 7F 00 00 | \88\9D\A8\FC%...\B0\EB\FC%..  
 004790: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0047A0: 00 00 00 00 00 00 00 00 90 C2 68 F7 3B 56 00 00 | .....90\C2h\F7;V..  
 0047B0: 70 5D D7 AC FF 7F 00 00 BA C2 68 F7 3B 56 00 00 | p] \FF...\BA\C2h\F7;V..  
 0047C0: 68 5D D7 AC FF 7F 00 00 1C 00 00 00 00 00 00 00 | h] \FF.....  
 0047D0: 04 00 00 00 00 00 00 00 C6 71 D7 AC FF 7F 00 00 | .....C6q \FF..  
 0047E0: D0 71 D7 AC FF 7F 00 00 DD 71 D7 AC FF 7F 00 00 | \D0q \FF...\DDq \FF..  
 0047F0: E6 71 D7 AC FF 7F 00 00 00 00 00 00 00 00 00 | \E6q \FF.....  
  
 004800: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004810: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004820: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004830: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004840: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004850: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004860: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004870: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004880: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 004890: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0048A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0048B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0048C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....  
 0048D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | .....

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0048E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0048F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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004A00: 00 00 00 00 00 00 00 00 |
004A10: 00 00 00 00 00 00 00 00 |
004A20: 00 00 00 00 00 00 00 00 |
004A30: 00 00 00 00 00 00 00 00 |
004A40: 00 00 00 00 00 00 00 00 |
004A50: 00 00 00 00 00 00 00 00 |
004A60: 00 00 00 00 00 00 00 00 |
004A70: 00 00 00 00 00 00 00 00 |
004A80: 00 00 00 00 00 00 00 00 |
004A90: 00 00 00 00 00 00 00 00 |
004AA0: 00 00 00 00 00 00 00 00 |
004AB0: 00 00 00 00 00 00 00 00 |
004AC0: 00 00 00 00 00 00 00 00 |
004AD0: 00 00 00 00 00 00 00 00 |
004AE0: 00 00 00 00 00 00 00 00 |
004AF0: 00 00 00 00 00 00 00 00 |
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004C00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004C90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004CF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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004F30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004F90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
004FF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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005260: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005270: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005280: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005290: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0052F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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005BF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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005D00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005D90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005DF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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005F00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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005F10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005F90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
005FF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |

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006240: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006250: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006260: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006270: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006280: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006290: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0062F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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006570: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006580: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
006590: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0065F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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0068A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0068B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0068C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0068D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0068E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
0068F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
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006A00: 00 00 00 00 00 00 00 00 |
006A10: 00 00 00 00 00 00 00 00 |
006A20: 00 00 00 00 00 00 00 00 |
006A30: 00 00 00 00 00 00 00 00 |
006A40: 00 00 00 00 00 00 00 00 |
006A50: 00 00 00 00 00 00 00 00 |
006A60: 00 00 00 00 00 00 00 00 |
006A70: 00 00 00 00 00 00 00 00 |
006A80: 00 00 00 00 00 00 00 00 |
006A90: 00 00 00 00 00 00 00 00 |
006AA0: 00 00 00 00 00 00 00 00 |
006AB0: 00 00 00 00 00 00 00 00 |
006AC0: 00 00 00 00 00 00 00 00 |
006AD0: 00 00 00 00 00 00 00 00 |
006AE0: 00 00 00 00 00 00 00 00 |
006AF0: 00 00 00 00 00 00 00 00 |
```





## 2. A description of the VCB structure

We have five variables in our VCB structure:

- int numBlocks — dictates the total number of blocks in the volume
- int blockSize — dictates how many bytes correspond to a single block
- int locOfFreespace — “pointer” to the first block of the free space bitmap
- int locOfRoot — “pointer” to the first block of the root directory
- long signature — a unique magic number to identify if the volume belongs to us

The VCB structure is the first block of the volume. It is used as an information hub containing all things pertinent to the volume. Initially, the signature is compared against to determine the volume’s owner. The remainder of the variables are to determine the total number of blocks in the volume. The size of each block. The start of the free space and the start of the root directory.

## 3. A description of the Free Space structure

For our free space structure, we used a bitmap. In our bitmap, we use "1" to indicate a used block and "0" to indicate a free block. We had functions for setting bits to one [void setBitOne()], setting bits to zero [void setBitZero()], and getting bits [bool getBit()]. We also wrote a function for allocating a contiguous set of free blocks, to be used for the root directory.

## 4. A description of the Directory system

- Directory system organizes all the files
- It contains reference to other files and possibly other directories
- Every Directory has a name of that directory entry, that is unique to that file
- Every Directory has a size of that file.
- For our directory entry we have indicated the total number of directory entries
- The bytes are needed

For our root directory, we created it by initializing an array of 50 directory entry structs. We then followed the procedure of setting the first two DEs to "." and ".." which both point to the location of the root itself, before writing the array to its designated location in storage.

#### 5. A table of who worked on which components

|          |                                                                                                                                                                                                                                                   |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tommy    | A role of planner and programmer in our group. Organized and planned meetings. Provider of ambient jazz music. Formulated bitmap, Bitmap, initFreeSpace implementation, initRootDE implementation, optimized allocate block free space algorithm. |
| Steve    | Init File System VCB structure, Bitmap initFreeSpace implementation during the meeting, calculated and implemented getFreeSpaceSize, allocated blocks for free space, initRootDE implementation, debugged and cleaned code.                       |
| Yueling  | Bitmap, initFreeSpace, implementation during the meeting, Directory Entry structure, initRootDE implementation.                                                                                                                                   |
| Nicholas | Looked for resources for bitmaps, initFreeSpace, Bitmap implementation during the meeting, initRootDE implementation. Code cleanup, write up.                                                                                                     |

#### 6. How did your team work together, how often you met, how did you meet, and how did you divide up the tasks?

We usually met 3-4 times per week on Zoom. During our meetings, we planned out what we needed to complete Milestone 1, which included understanding bitmaps and going over what components we needed to implement (the VCB structure, the bitmap functions for tracking free space, and the directory system). Each and every meeting was documented on a spreadsheet including when we met up as well as the topics discussed and homework distributed to everyone. Most of the coding we did together but for individual work, we gave small tasks here and there. For example, once we overcame our obstacle with the double pointer, Steve finished up the remainder of the initFreespace function. Yueling started on the initRootDE and Nicholas started on the project write up.

7. A discussion of what issues you faced and how your team resolved them.

One issue that we faced was understanding how to use bitmaps. To wrap our heads around bitmaps, we researched more about them from articles and videos online and discussed what we learned during our meetings. When debugging our code, we used printf statements to determine if the outputs were correct. When the outputs were incorrect, we discussed on Zoom how to modify the code so that we got the right outputs. For example, when we created a double pointer for one of the bitmap functions, the code did not compile correctly. Once we realized that we should have just used one pointer instead, we were able to successfully compile the code.

Screenshot of compilation

A screenshot of a terminal window with a dark background. The window title is "parallels@ubuntu-linux-22-04-desktop: ~/Documents/CSC415". The terminal shows the execution of the 'make' command, which triggers three gcc compilation commands. The first two compile 'fsshell.c' and 'fsInit.c' into object files. The third command links these object files with 'fsLowM1.o' and various system libraries (-lm, -lreadline, -lpthread) to create the final executable 'fsshell'. The prompt returns to the shell after successful compilation.

```
parallels@ubuntu-linux-22-04-desktop: ~/Documents/CSC415
parallels@ubuntu-linux-22-04-desktop:~/Documents/CSC415/csc415-filesystem-kpcrocks$ make
gcc -c -o fsshell.o fsshell.c -g -I.
gcc -c -o fsInit.o fsInit.c -g -I.
gcc -o fsshell fsshell.o fsInit.o fsLowM1.o -g -I. -lm -l readline -l pthread
parallels@ubuntu-linux-22-04-desktop:~/Documents/CSC415/csc415-filesystem-kpcrocks$
```