

ICS-462

Programming Assignment #4

March 29, 2016

50 points

Due: As posted on D2L

Steps:

1. Review how to read and write flat files in java
 - a. <http://www.javapractices.com/topic/TopicAction.do?Id=245>
 - b. <https://www.caveofprogramming.com/java/java-file-reading-and-writing-files-in-java.html>
2. Review FAT in general
 - a. <https://www.win.tue.nl/~aeb/linux/fs/fat/fat-1.html>
 - b. Dump reading presentation on D2L
 - c. Remember FAT entries.
 - i. 0000 Entry is free
 - ii. 2 to 0x0FFEF are cluster numbers
 - iii. fff0-fff6: reserved,
 - iv. fff7: bad cluster,
 - v. fff8-ffff: cluster in use, the last one in this file.
3. Review Endian'ness
 - a. <https://www.cs.umd.edu/class/sum2003/cmsc311/Notes/Data/endian.html>
4. Review Signed and Unsigned types:
 - a. <http://ee.hawaii.edu/~tep/EE160/Book/chap5/subsection2.1.1.1.html>
5. Understand bytearray in java
 - a. <https://worldmodcode.wordpress.com/2012/12/14/the-java-bytebuffer-a-crash-course/>
6. For this assignment you are going to need to be able to
 - a. Read a block of data from a binary file in java
 - b. Write a block of data to a binary file in java
 - c. Manipulate data without disrupting the sign nor the endian'ness
7. It may be beneficial to get the code in "Handy Source Code" building and running first, to display the contents of the file system as you get started.

8. You have been given a file system named ICS46img.zip. Unzip this file, the result will be FAT16. On this file system is a deleted cat picture. Hint: It is found in the root directory. You may assume all the clusters are consecutive. (even if it turns out they are not)
9. You are to write a program in java which restores the the deleted cat picture. This will require rebuilding the file allocation table.
10. IN ADDITION: You are to write a program which creates a new file which holds the text from pages 3 and 4 of this document.
11. When completed, the file allocation table you constructed should support the new file and the recovered file.
12. How to test:
 - a. Windows. The 7zip utility can open .img files. You should be able to see your two files in the .img file you create.
 - b. Mac: Simply double click the .img file and it should open in the finder window.
 - c. Once open, you should be able to see your file in it's entirety!
13. What to turn in:
 - a. Your exported java project from eclipse.
 - b. Your disk image is not necessary as your program will recreate the files.
14. Grading as described in course rubric.
15. Notice of copyright: This homework assignment is copyrighted by Michael Dorin including the supporting files such as the disk image file and the cat picture! Posting this information outside the Metro State University environment is prohibited.

Text:

So shaken as we are, so wan with care,
Find we a time for frightened peace to pant,
And breathe short-winded accents of new broils
To be commenced in strands afar remote.
No more the thirsty entrance of this soil
Shall daub her lips with her own children's blood;
Nor more shall trenching war channel her fields,
Nor bruise her flowerets with the armed hoofs
Of hostile paces: those opposed eyes, 10
Which, like the meteors of a troubled heaven,
All of one nature, of one substance bred,
Did lately meet in the intestine shock
And furious close of civil butchery
Shall now, in mutual well-beseeming ranks,
March all one way and be no more opposed
Against acquaintance, kindred and allies:
The edge of war, like an ill-sheathed knife,
No more shall cut his master. Therefore, friends,
As far as to the sepulchre of Christ,
Whose soldier now, under whose blessed cross
We are impressed and engaged to fight,
Forthwith a power of English shall we levy;
Whose arms were moulded in their mothers' womb
To chase these pagans in those holy fields
Over whose acres walk'd those blessed feet
Which fourteen hundred years ago were nail'd
For our advantage on the bitter cross.
But this our purpose now is twelve month old,
And bootless 'tis to tell you we will go:
Therefore we meet not now. Then let me hear
Of you, my gentle cousin Westmoreland,
What yesternight our council did decree
In forwarding this dear expedience.
FROM fairest creatures we desire increase,
That thereby beauty's rose might never die,
But as the ripper should by time decease,
His tender heir might bear his memory:
But thou, contracted to thine own bright eyes,
Feed'st thy light'st flame with self-substantial fuel,
Making a famine where abundance lies,

Thyself thy foe, to thy sweet self too cruel.
Thou that art now the world's fresh ornament
And only herald to the gaudy spring,
Within thine own bud buriest thy content
And, tender churl, makest waste in niggarding.
Pity the world, or else this glutton be,
To eat the world's due, by the grave and thee.
Look in thy glass, and tell the face thou viewest
Now is the time that face should form another;
Whose fresh repair if now thou not renewest,
Thou dost beguile the world, unbless some mother.
For where is she so fair whose unear'd womb
Disdains the tillage of thy husbandry?
Or who is he so fond will be the tomb
Of his self-love, to stop posterity?
Thou art thy mother's glass, and she in thee
Calls back the lovely April of her prime:
So thou through windows of thine age shall see
Despite of wrinkles this thy golden time.
But if thou live, remember'd not to be,
Die single, and thine image dies with thee.
Those hours, that with gentle work did frame
The lovely gaze where every eye doth dwell,
Will play the tyrants to the very same
And that unfair which fairly doth excel:
For never-resting time leads summer on
To hideous winter and confounds him there;
Sap cheque'd with frost and lusty leaves quite gone,
Beauty o'ersnow'd and bareness every where:
Then, were not summer's distillation left,
A liquid prisoner pent in walls of glass,
Beauty's effect with beauty were bereft,
Nor it nor no remembrance what it was:
But flowers distill'd though they with winter meet,
Leese but their show; their substance still lives sweet.