Name: _____ Date: _____

Chapter 4 File Management
4.1 File and Folder Names

Grading:

Notes: _____/20
Outline: _____/20
Lesson Review: _____/20
Deleted File: _____/40
Total points: _____/100

Essential Question

How is a file-naming scheme important to good computing?

Section 4.1 Learning Goals

After completing this section, you will be able to:

- Explain how to create meaningful, legal file names.
- Use Windows Explorer to rename files and folders.

Competencies

- 6670.52 Manage various file types.

Terms

- CamelCase
- file association
- file name
- file name extension
- file path
- file tree
- folder
- folder name
- library
- naming convention
- nested
- reserved symbols
- subfolder

Windows File and Folder Names

- **File name** is a label that identifies a _____ file on a computer system
- **Folder** is a container in which files are stored
- **Subfolders** are folders contained _____ another folder
- Subfolders are **nested** in other folders
- A **folder name** is a label that _____ a unique folder on a computer system
- Legal Names

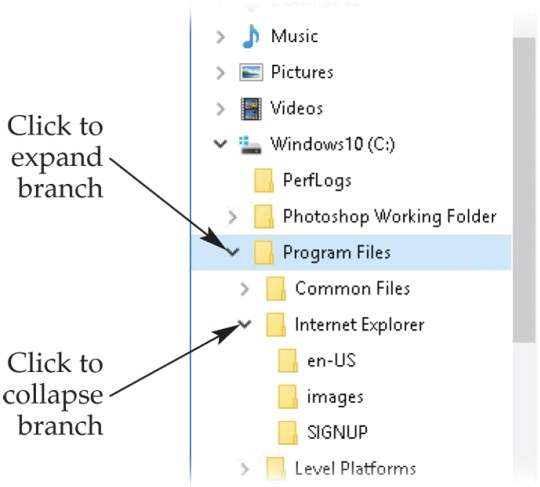
    - Drive and folder _____ of a file plus its file name is the **file path**
    - **Reserved symbols** are characters that Windows uses for special meaning
    - Up to _____ characters for name and path
    - Spaces permitted but pose problems for other systems
- Meaningful Names
    - **Naming convention** is a _____ that is followed whenever a file name is created
    - **CamelCase** is a naming convention in which the of each word in the name is capitalized
- **File Name Extensions**
    - Tells the Windows operating system which _____ to use to open the file
    - **File association** is a process in which Windows _____ a file name extension to a software program
- Naming a Group of Related Files
    - Use a similar word pattern
    - _____ words cause files to be displayed together
    - Include creation _____ in the file name

Extension	File Type	Associated Application
.avi	Video	Windows Media Player
.css	Cascading style sheet	Default browser
.doc, .docx	Document	Microsoft Word
.exe	Executable application	Windows operating system
.htm, .html	Hypertext markup (web page)	Default browser
.jpg, .jpeg	Compressed image	Default image editor
.m4a	Audio-only MPEG4	Windows Media Player
.mp3	Music or sound	Windows Media Player
.pdf	Portable Document Format	Adobe Reader
.pps	Slide show	Microsoft PowerPoint
.ppt	Presentation	Microsoft PowerPoint
.rtf	Rich text format document	Default document editor
.swf	Flash format	Flash Player
.tif, .tiff	Compressed image file	Windows Photo Viewer
.txt	Text	Notepad
.wpd	Document	Corel WordPerfect
.xls, .xlsx	Spreadsheet	Microsoft Excel
.zip	Compressed archive	Windows Explorer

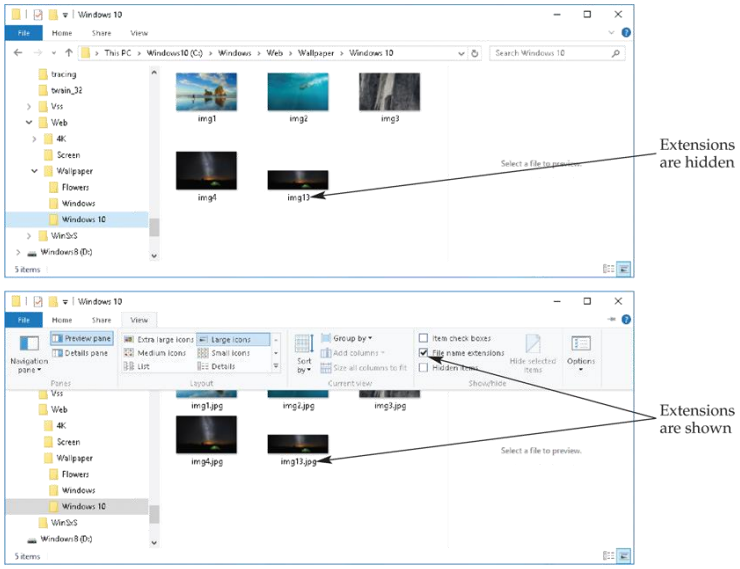
Goodheart-Willcox Publisher

Windows File Explorer

- Locate and manage files
- Interface contains
    - Address bar
    - Ribbon toolbar
    - Navigation pane on left
    - Folder contents on right
- **File tree** can be _____ to display subfolders and the files contained within them
- Folders
    - Organizational tool
    - _____ name appears on desktop
        - Documents folder
        - Default storage location
    - Limit file number to window size



- **Libraries**
  - Collections of _____ files and folders that are displayed together, but that may be stored in different locations
  - No file or folder connected to a library
  - Deleting a _____ will *not* affect the folders within
- Displaying File Name Extensions
  - Useful information _____ from users
  - Can be changed using **Folder Options** feature
- Renaming Files and Folders
  - File menu _____ feature
  - Use shortcut menu
  - Single-click twice to reenter name



Outline: Chapter 4 File Management (pages 129-171)

<u>Section 4.1</u> – File and Folder Names (pages 129-144)

A.

a.

b.

c.

d.

B.

a.

b.

c.

d.

Section 4.1 Summary:

Section 4.1 Review

1. What are the three parts of a file name?
    a.
    b.
    c.

2. What are the two parts of the file path?
    a.
    b.

3. Write this file name in CamelCase:
   My Picture of Venice.jpg.

4. What is a library in Windows Explorer?

5. Why would you turn on the display of file name extensions?

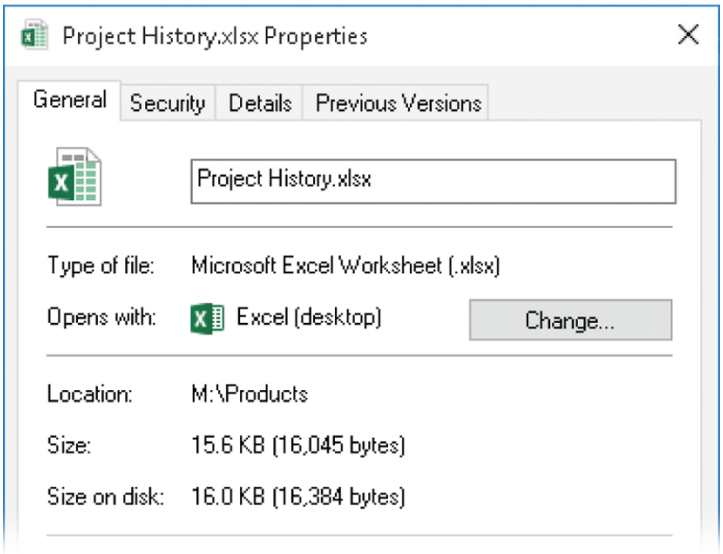
6. The dialog box displays the properties of a file. What is the file size?

A. 16,045 KB

B. Not displayed

C. 15.6 KB

D. 15.6 MB



7. Using capital letters to show where new words start in a fi le name is called _____.

A. CamelCase
B. title case
C. uppercase
D. lowercase

8. Which of the following is *not* a good file management practice?

A. Create descriptive names for folders and files.
B. Store all of the data fi les at the top level of the drive to make them easier to find.
C. Remove folders and fi les when they are no longer needed.
D. Make enough subfolders so that the files in any one folder are readily visible.

9. The three parts of a fi le path in Windows are the _____.

10. A(n) _____ is a pattern that is followed whenever a fi le name is created.

Is a Deleted File Really Gone?

Abstract

When you delete a file, by accident or on purpose, is the information really gone? Can you get it back? If you accidentally deleted your five-page report for school, you are hoping it is not gone. On the other hand, if you do not want someone to get their hands on the goofy and unflattering pictures you and your best friend took while staying up late the other night, you probably hope it *is* gone for good! It might be nice to know for sure either way. Try this project to find out.

Objective

Experiment to see what it takes to completely delete a computer file.

Introduction

You deleted the file—it is gone. Or is it? This is a question computer expert get asked often. Sometimes the question comes from frantic students who accidentally deleted a long, hard-to-write paper. Sometimes the question comes from police officers or lawyers working on a criminal case. Either way, the person asking is desperate to know the answer.

In a criminal case, it is the job of a **forensic computer analyst** to find out the answer. The analyst uses sophisticated tools to carefully and painstakingly look through a suspect's computer to recover evidence from saved files—and even files the suspect thought they deleted. In this project, you will do a similar task. You will search for computer files that may or may not have been deleted using several possible deletion techniques. Before you get started, you need to know a bit about how computers store information and what it means to delete something. We will give you a basic explanation here, but you should check out the resources in the Bibliography section for a more complete understanding.

When a file is saved to a computer's **hard-disk drive**, the file is stored in multiple sections, called **clusters**, on the hard drive. The number of clusters that the file takes up depends on how much information is in the file. The more information, the larger the file, and the more space it takes on the hard drive. The computer only saves a file to clusters of the hard drive that it thinks of as "empty." It also creates a record of where it stored the file in a large table. The table tells the computer what files are stored where. In Figure 1 you can see an illustration of a book report stored across several clusters of a hard drive with empty hard drive space on either side.

Figure 1. Files, like this book report, are stored in multiple clusters on the hard drive. Clusters next to a file can be empty or filled with a different file. As a side note, the clusters that store a file do not all have to be physically next to each other.

If you select a file and press the *delete* button, the file will go in to a folder marked Trash if you are using a Mac, or marked Recycle Bin if you are using a Windows computer. Emptying the Trash/Recycle Bin (if you do not know how to do this, ask an adult who is comfortable using computers or do an internet search on "how to empty my computer's Trash/Recycle Bin") tells the computer to get rid of the table entry that says what the file is called and where it is stored on the hard drive. It also signals to the computer to think of those hard drive clusters as "empty" again, even though there is information sitting in them.

Once the computer thinks of the hard drive clusters as "empty," it can store other files in those spaces by writing over the information that was previously in them. Figure 2 shows an example of this; once the book report was deleted, the computer could store other files in the same space. Notice that not all of the clusters are written over. This is a matter of luck. If a smaller file like the photo in the example shown in Figure 2 is stored in the same space a larger file, like the book report, used to take up, several of the clusters next to it may not be overwritten.

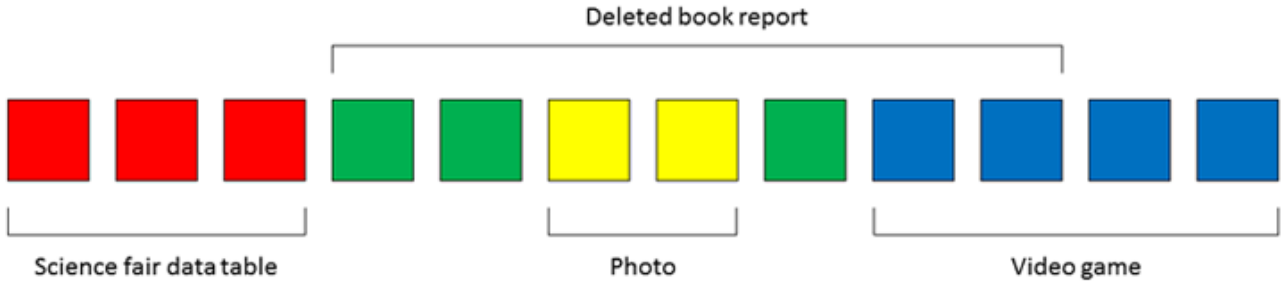


Figure 2. Once a file is deleted, the file system manager allows the hard drive clusters to be overwritten with new files.

Using **data recovery tools** that look at whether a hard drive cluster is truly empty or not, forensic computer analysts can sometimes retrieve all or parts of a file if it has not been written over. You will try this yourself using free data recovery tools for this science project.

Sometimes people deliberately write over a file to keep the data secret. This is called **overwriting or file shredding**, and there are tools to do this too (you will investigate some of them during your project). Do you think it is possible to recover these files?

With the help of an adult who knows how to use the computer, and permission from the computer's owner, you will compare how much effort it takes to find saved, trashed, deleted, and shredded files. Which of these do you think you will be able to find? How long do you think it will take you? Good luck searching!

Terms and Concepts

- Forensic computer analyst
- Hard-disk drive
- Hard-disk drive clusters
- Deleting a file
- Data recovery
- Overwriting files
- File shredding
- Operating system
- File extension

Questions

- What are a person's expectations when they say they have deleted a file?
- How are files stored on a hard disk drive? What happens when you delete a file by emptying the Trash/Recycle Bin on a Windows or Mac operating system?
- What does a file recovery tool do and how does it work?
- Under what conditions could a file not be recovered?

Materials and Equipment

- Computer with a hard-disk drive; you must have the owner's permission to make files, delete them, search the computer, and install software. *Note:* A solid state drive will not work for this project. Solid state drives are a different technology and do not deal with deleting data in the same way.
- Mac or Windows operating system; if you want to use a computer with a Chrome operating system, you will have to adapt the experimental procedure yourself. Chrome operating system does not have a trash/recycle option.
- Adult helper who is comfortable using the computer

Credits

- Sandra Slutz, PhD, Science Buddies

Cite This Page - MLA Style

- Slutz, Sandra. "Is a Deleted File Really Gone?" *Science Buddies*. Science Buddies, 8 Sep. 2017. Web. 30 Dec. 2017 <https://www.sciencebuddies.org/science-fair-projects/project-ideas/CompSci_p061/computer-science/is-a-deleted-file-really-gone>
- APA Style
- Slutz, S. (2017, September 8). *Is a Deleted File Really Gone?.* Retrieved December 30, 2017 from https://www.sciencebuddies.org/science-fair-projects/project-ideas/CompSci_p061/computer-science/is-a-deleted-file-really-gone

Bibliography

This website is a good place to look up computer terms like hard drive, delete, trash, and overwrite.

- Christensson, Per. (n.d.) *The Tech Terms Computer Dictionary.* Retrieved December 2, 2016 from http://techterms.com

More information about storing, deleting, and recovering files can be found in these resources:

- How To Geek Contributors. (2015, September 29). *Why Deleted Files Can Be Recovered, and How You Can Prevent It.* Retrieved December 2, 2016 fromhttp://www.howtogeek.com/125521/
- Powell, Oliver. (2015, May 6). *What is Data Recovery and How It Is Helpful for You?* Retrieved December 2, 2016 from http://www.stellarinfo.com/blog/know-about-data-recovery/

For help creating graphs, try this website:

- National Center for Education Statistics, (n.d.). *Create a Graph*. Retrieved June 2, 2009, from http://nces.ed.gov/nceskids/createagraph/

Table 1

File Name	File Found (yes/no)	File Recovery Difficulty Level	Text in File	File Treatment
Chicken scratch				
Disguised				
Easter egg				
Fairy dust				
False diary				
Kittens				
Presents				
Puppies				
Secrets				
Surprise				
Unknown				
Your gift				

Collecting Your Data

Once your adult helper has followed all the instructions in the Preparing the Files section and created the files on your computer, you are ready to collect your data. Your goal is to search for each of the files listed in **Table 1** and rate how difficult it was to find each one.

1. Decide which file from **Table 1** you are trying to find.
2. Search the computer for the file. The file should have a .txt extension.

a. First look on the computer's hard drive using the operating system's search tool. If you find the file, note that in Table 1 and write "very easy" in the File Recovery Difficulty Level column.
b. If you do not find the file in the hard drive, try searching the Trash/Recycling Bin. If you find the file, note that in Table 1 and write "easy" in the File Recovery Difficulty Level column.
c. If you cannot find the file anywhere on the computer, try running the file recovery tool and searching for it among the recovered files. If you find the file, note that in Table 1 and write "medium" in the File Recovery Difficulty Level column.
d. If you still cannot find the file and are ready to give up looking, note that in Table 1 and put "hard" in the File Recovery Difficulty Level column.

Table 1. Fill in this data table as you try to find each file.

3. If you do find the file, also record what the text was in the file.
4. Repeat steps 1-4 for each of the 12 files. When you have as many found of the 12 files as you can, download and open the adult helper PDF.
    a. For each file you found, check to see if the text in the file you found matches the text that was supposed to be in the file. If it does match, you can be sure you have found the right file. If it does not match, check with your adult helper—you may not have found the file!
    b. If you found the wrong file, you will need to go back and keep trying to find the right one. Make sure to update your data table as needed.
    c. Copy the file treatments (saved, trashed, deleted, or overwritten) for all 12 of the files from the adult helper PDF in to your data table.

Analyzing Your Data

1. Make a summary table of your data like Table 2.
    a. Look at the data from just the files in the "saved" file treatment group. Calculate how many of the files you found in that treatment. The minimum number should be 0 and the maximum number should be 3.
    b. Convert the File Recovery Difficulty Levels in Table 1 from words to numbers. Then calculate the Average Difficulty Level for the "saved" file treatment group.
        i. Very easy should be a difficulty level of 1.
        ii. Easy should be a difficulty level of 2.
        iii. Medium should be a difficulty level of 3.
        iv. Hard should be a difficulty level of 4.
    c. Repeat steps a-b for the other three file treatment groups: trashed, deleted, and overwritten.

File Treatment Group	Number of Files Found	Average Difficulty Level
Saved: file was saved to computer's hard drive		
Trashed: saved file was moved to the computer's trash		
Deleted: saved file was moved to computer's trash, then trash was emptied		
Overwritten: a program was used to write over the deleted file		

Table 2. Summarize your findings in a table like this one.

2. Make a bar graph of the Number of Files Found.
    a. You can do this by hand on graph paper, use a spreadsheet program like Excel, or use an online graph making tool like Create a Graph.
    b. Label the y-axis *Number of Files Found*. Label the x-axis *File Treatment Group* and make sure each bar is clearly labeled as data from the saved, deleted, trashed, or overwritten treatment groups.
3. Make a similar bar graph of the Average Difficulty Level.

Making Your Conclusions

1. Now that all your data is summarized in front of you, look at it carefully and figure out what conclusions you can make from your experiment.

2. What does your data tell you about what actions are required to make a computer file truly gone?

3. How much effort does it take to find a file on a computer? How does trashing that file, deleting it by emptying the trash, or overwriting it change the amount of effort needed to read the text in the file?

PrintFreeGraphPaper.com