Programming and Data Structures
Active Learning Activity 4: Recursion

Activity Objectives

At the end of this activity, students should be able to:

1. Write recursive methods to solve a given problem using recursion

2. Test recursive methods

Activity

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1. Write two recursive methods as described below:

   a. *String searchFile(String path, String filename)* that returns the path to the directory where *filename* is found or an empty string otherwise. The method should search for *filename* recursively starting from the directory *path*.

   b. *void findWord(String path, String word)* that prints the number of occurrences of *word* in all the files under the directory *path*. The method should look for *word* recursively in all the files under *path*.

2. Write a program named "*Recursion.java*" that prompts the user to enter:

   a. a path to a directory name and a filename and displays the path where the file is found. If the file is not found, display the message "File not found".

   b. a path to a directory and a word and displays the number of occurrences of the word in each file where it is found.

3. A sample run of the program is provided below. Submit the file *Recursion.java* on Github.

Enter a directory:
/Users/houdghiri/Documents/Fall_2021
Enter the filename:
4_CSE17_Recursion.pdf

File 4_CSE17_Recursion.pdf found in:
/Users/houdghiri/Documents/Fall_2021/Lectures/4_CSE17_Recursion.
pdf

Enter a directory:
/Users/houdghiri/Documents/Fall_2021
Enter a word:
Person

Person appears 5 times in the file
/Users/houdghiri/Documents/Fall_2021/Grading/dictionary.txt

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/testing–
houdghiri2021/src/Test.java

Person appears 6 times in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/testing–
houdghiri2021/src/Person.java

Person appears 5 times in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/ALA_1/src/Tes
t.java

Person appears 7 times in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/ALA_1/src/Per
son.java

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/ALA_1/src/Stu
dent.java

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/ALA_1/src/Emp
loyee.java

Person appears 5 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/.metadata/.pl
ugins/org.eclipse.core.resources/.history/ea/c0619a3c1009001c1a2ef59185c17f80

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/.metadata/.pl
ugins/org.eclipse.ltk.core.refactoring/.refactorings/Test/2021/8/36/refactori
ngs.history

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/.metadata/.pl

ugins/org.eclipse.ltk.core.refactoring/.refactorings/active-learning-
activity-1-houdghiri2021/2021/8/35/refactorings.history

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/.metadata/.pl
ugins/org.eclipse.ltk.core.refactoring/.refactorings/ALA1/2021/8/35/refactori
ngs.history

Person appears 1 time in the file
/Users/houdghiri/Documents/Fall_2021/eclipse_projects_fall_2021/.metadata/.pl
ugins/org.eclipse.e4.workbench/workbench.xmi

Person appears 9 times in the file
/Users/houdghiri/Documents/Fall_2021/Person.java

Person appears 5 times in the file
/Users/houdghiri/Documents/Fall_2021/ALAs/Person.java

Useful methods from class ***File***

1. ***boolean isFile()*** returns true if the filename associated with the File object is a text file

2. ***boolean isDirectory()*** returns true if the filename associated with the File object is a directory (folder)

3. ***File[] listFiles()*** returns an array that contains the list of files and subfolders in the directory associated with the File object

4. ***String getName()*** returns the name of the file or directory associated with the File object

5. ***String getAbsolutePath()*** returns the path to the file or directory associated with the File object.