Virtual Key for Your Repositories [LockedMe]

Sameer Safdar Khan

https://github.com/SameerKhan0411/Sameer_Khan.git

Project: 1

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(Writeup)

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GitHub repository link:

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INDEX

SPRINTS PLANNING:

The project is planned to be completed in 2 sprints.

Tasks assumed to be completed in the sprint 1 are:

- Creating the flow of the application.
- Initializing git repository to track changes as development progresses.
- Writing the Java program to fulfil the requirements of the project.

Tasks assumed to be completed in the sprint 2 are:

- Testing the Java program with different kinds of User input.
- Pushing code to GitHub.
- Creating this specification document highlighting application capabilities, appearance, and user interactions.

Concepts used in project:

- ***Collection framework***: The Collection in Java is a framework that provides an architecture to store and manipulate the group of objects. Java Collections can achieve all the operations that you perform on a data such as searching, sorting, insertion, manipulation, and deletion.

- ***File Handling***: File handling in Java is defined as reading and writing data to a file. The particular file class from the package called java.io allows us to handle and work with different formats of files.

- ***Sorting***: Sorting is the process of putting a list or a group of items in a specific order. Some common sorting criteria are: alphabetical or numerical. Sorting can also be done in ascending order (A-Z) or descending order (Z-A). Sorting refers to ordering data in an increasing or decreasing fashion according to some linear relationship among the data items. Sorting can be done on names, numbers and records. That is, sorting greatly improves the efficiency of searching.

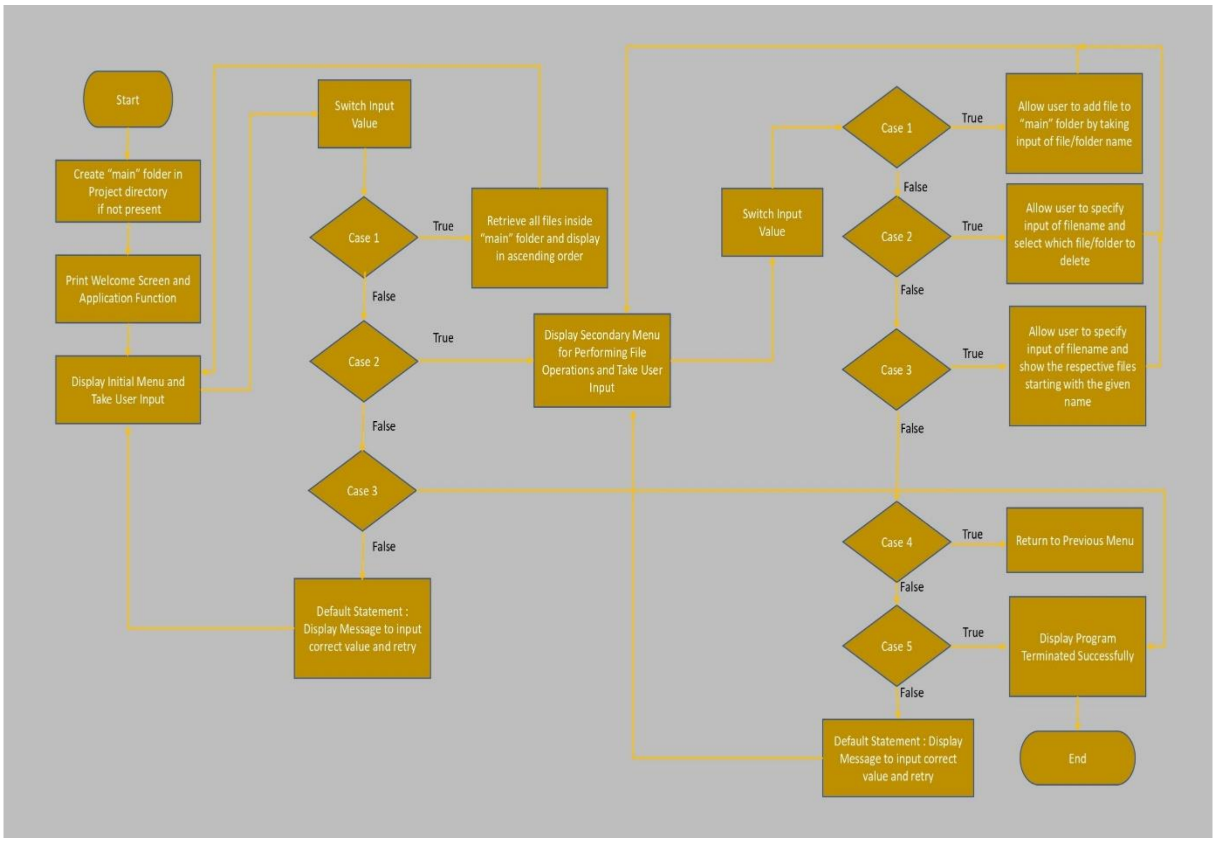
- ***Flow Control***: Control flow statements let you control the flow of the execution of the code in your program. In Java programming language, you can control the flow of execution of the code by placing the decision making, branching, looping, and adding conditional blocks.

- ***Recursion***: Recursion in java is a process in which a method calls itself continuously. A method in java that calls itself is called recursive method.

- ***Exception Handling***: The Exception Handling in Java is one of the powerful mechanisms to handle the runtime errors so that the normal flow of the application can be maintained.

- ***Streams API***: The Stream API is used to process collections of objects. A stream is a sequence of objects that supports various methods which can be pipelined to produce the desired result.

Flow of the program.


Start
Create "main" folder in Project directory if not present
Print Welcome Screen and Application Function
Display Initial Menu and Take User Input
Switch Input Value
Case 1
True
Retrieve all files inside "main" folder and display in ascending order
False
Case 2
True
Display Secondary Menu for Performing File Operations and Take User Input
False
Case 3
False
Default Statement : Display Message to input correct value and retry
Switch Input Value
Case 1
True
Allow user to add file to "main" folder by taking input of file/folder name
False
Case 2
True
Allow user to specify input of filename and select which file/folder to delete
False
Case 3
True
Allow user to specify input of filename and show the respective files starting with the given name
False
Case 4
True
Return to Previous Menu
False
Case 5
True
Display Program Terminated Successfully
False
Default Statement : Display Message to input correct value and retry
End

Development steps of program.

The steps involved in the development of program are:

1. Creating project in Eclipse.
2. Java program for entry point of application. [LockedMeMain.java]
3. Java program for display of menu options. [MenuOptions.java]
4. Java program for menu options handling. [HandleOptions.java]
5. Java program for specified file operations. [FileOperations.java]

1: Creating a new project in Eclipse

- Open Eclipse
- Go to File -> New -> Project -> Java Project -> Next.
- Type in any project name and click on "Finish."
- Select your project and go to File -> New -> Class.
- Enter **LockedMeMain** in any class name, check the checkbox "public static void main(String[] args)", and click on "Finish."

2: Java program for entry point of application. [LockedMeMain.java]

```
	package com.lockedme;

public class LockedMeMain {

	public static void main(String[] args) {

FileOperations.createMainFolderIfNotPresent("main");

MenuOptions.printWelcomeScreen("LockedMe","Sameer Khan");

HandleOptions.handleWelcomeScreenInput();

	}
}
```

3: Java program for display of menu options. [MenuOptions.java]

```java
package com.lockedme;

public class MenuOptions {

        public static void printWelcomeScreen(String appName, String developerName) {
                String companyDetails =
String.format("******************************************************\n"
                                + "** Welcome to %s.com. \n" + "** This application was
developed by %s.\n"
                                +
"******************************************************\n", appName,
developerName);
                                String appFunction = "You can use this application to :-\n"
                                + "• Retrieve all file names in the \"main\" folder\n"
                                + "• Search, add, or delete files in \"main\" folder.\n"
                                + "\n**Please be careful to ensure the correct filename is
provided for searching or deleting files.**\n";
                                System.out.println(companyDetails);
                                System.out.println(appFunction);
        }
        public static void displayMenu() {
                String menu = "\n\n****** Select any option number from below and press
Enter ******\n\n"
                                + "1) Retrieve all files inside \"main\" folder\n" + "2) Display
menu for File operations\n"
                                + "3) Exit program\n";
                                System.out.println(menu);
        }
        public static void displayFileMenuOptions() {
                String fileMenu = "\n\n****** Select any option number from below and
press Enter ******\n\n"
                                + "1) Add a file to \"main\" folder\n" + "2) Delete a file from
\"main\" folder\n"
                                + "3) Search for a file from \"main\" folder\n" + "4) Show
Previous Menu\n" + "5) Exit program\n";
                                System.out.println(fileMenu);
        }
}
```

4: Java program for menu options handling. [HandleOptions.java]

```
package com.lockedme;

import java.util.List;
import java.util.Scanner;

public class HandleOptions {
	public static void handleWelcomeScreenInput() {
		boolean running = true;
		Scanner sc = new Scanner(System.in);
		do {
			try {
				MenuOptions.displayMenu();
				int input = sc.nextInt();

				switch (input) {
				case 1:
					FileOperations.displayAllFiles("main");
					break;
				case 2:
					HandleOptions.handleFileMenuOptions();
					break;
				case 3:
					System.out.println("Program exited successfully.");
					running = false;
					sc.close();
					System.exit(0);
					break;
				default:
					System.out.println("Please select a valid option from 
above.");
				}
			} catch (Exception e) {
				System.out.println(e.getClass().getName());
				handleWelcomeScreenInput();
			}
		} while (running == true);
	}

	public static void handleFileMenuOptions() {
		boolean running = true;
		Scanner sc = new Scanner(System.in);
		do {
			try {
				MenuOptions.displayFileMenuOptions();
				FileOperations.createMainFolderIfNotPresent("main");
				int input = sc.nextInt();
				switch (input) {
				case 1:
					System.out.println("Enter the name of the file to be
added to the \"main\" folder");
					String fileToAdd = sc.next();

					FileOperations.createFile(fileToAdd, sc);

					break;
				case 2:
					System.out.println("Enter the name of the file to be
deleted from \"main\" folder");
					String fileToDelete = sc.next();

					FileOperations.createMainFolderIfNotPresent("main");
					List<String> filesToDelete =
FileOperations.displayFileLocations(fileToDelete, "main");

					String deletionPrompt = "\nSelect index of which file to
delete?"
							+ "\n(Enter 0 if you want to delete all
elements)";
					System.out.println(deletionPrompt);

					int idx = sc.nextInt();

					if (idx != 0) {

	FileOperations.deleteFileRecursively(filesToDelete.get(idx - 1));
					} else {

						for (String path : filesToDelete) {

	FileOperations.deleteFileRecursively(path);
						}
					}
					break;
				case 3:
					System.out.println("Enter the name of the file to be
searched from \"main\" folder");
					String fileName = sc.next();

					FileOperations.createMainFolderIfNotPresent("main");
					FileOperations.displayFileLocations(fileName, "main");

					break;
				case 4:
					return;
				case 5:
```

```
                                                System.out.println("Program exited successfully.");
                                                running = false;
                                                sc.close();
                                                System.exit(0);
                                        default:
                                                System.out.println("Please select a valid option from
above.");
                                        }
                                } catch (Exception e) {
                                        System.out.println(e.getClass().getName());
                                        handleFileMenuOptions();
                                }
                        } while (running == true);
                }
}
```

5: Java program for specified file operations. [FileOperations.java]

```
package com.lockedme;

import java.io.File;
import java.io.IOException;
import java.nio.file.Files;
import java.nio.file.Path;
import java.nio.file.Paths;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.Scanner;
import java.util.stream.Collectors;
import java.util.stream.IntStream;

public class FileOperations {

	public static void createMainFolderIfNotPresent(String folderName) {
		File file = new File(folderName);

		if (!file.exists()) {
			file.mkdirs();
		}
	}

	public static void displayAllFiles(String path) {
		FileOperations.createMainFolderIfNotPresent("main");
		System.out.println("Displaying all files with directory structure in ascending
order\n");
		List<String> filesListNames = FileOperations.listFilesInDirectory(path, 0, new
ArrayList<String>());

		System.out.println("Displaying all files in ascending order\n");
		Collections.sort(filesListNames);

		filesListNames.stream().forEach(System.out::println);
	}

	public static List<String> listFilesInDirectory(String path, int indentationCount,
List<String> fileListNames) {
		File dir = new File(path);
		File[] files = dir.listFiles();
		List<File> filesList = Arrays.asList(files);
		Collections.sort(filesList);
		if (files != null && files.length > 0) {
			for (File file : filesList) {

				System.out.print(" ".repeat(indentationCount * 2));

				if (file.isDirectory()) {
					System.out.println("`-- " + file.getName());
```

```
                                        fileListNames.add(file.getName());
                                        listFilesInDirectory(file.getAbsolutePath(), indentationCount
+ 1, fileListNames);
                                } else {
                                        System.out.println("|-- " + file.getName());
                                        fileListNames.add(file.getName());
                                }
                        }
                } else {
                        System.out.print(" ".repeat(indentationCount * 2));
                        System.out.println("|-- Empty Directory");
                }
                System.out.println();
                return fileListNames;
        }

        public static void createFile(String fileToAdd, Scanner sc) {
                FileOperations.createMainFolderIfNotPresent("main");
                Path pathToFile = Paths.get("./main/" + fileToAdd);
                try {
                        Files.createDirectories(pathToFile.getParent());
                        Files.createFile(pathToFile);
                        System.out.println(fileToAdd + " created successfully");
                        System.out.println("Would you like to add some content to the file? (Y/N)");
                        String choice = sc.next().toLowerCase();
                        sc.nextLine();
                        if (choice.equals("y")) {
                                System.out.println("\n\nInput content and press enter\n");
                                String content = sc.nextLine();
                                Files.write(pathToFile, content.getBytes());
                                System.out.println("\nContent written to file " + fileToAdd);
                                System.out.println("Content can be read using Notepad or
Notepad++");
                        }

                } catch (IOException e) {
                        System.out.println("Failed to create file " + fileToAdd);
                        System.out.println(e.getClass().getName());
                }
        }

        public static List<String> displayFileLocations(String fileName, String path) {
                List<String> fileListNames = new ArrayList<>();
                FileOperations.searchFileRecursively(path, fileName, fileListNames);

                if (fileListNames.isEmpty()) {
                        System.out.println("\n\n***** Couldn't find any file with given file name \""
+ fileName + "\" *****\n\n");
                } else {
                        System.out.println("\n\nFound file at below location(s):");

                        List<String> files = IntStream.range(0, fileListNames.size())
                                        .mapToObj(index -> (index + 1) + ": " +
fileListNames.get(index)).collect(Collectors.toList());
```

```
				files.forEach(System.out::println);
			}

			return fileListNames;
		}

		public static void searchFileRecursively(String path, String fileName, List<String>
fileListNames) {
			File dir = new File(path);
			File[] files = dir.listFiles();
			List<File> filesList = Arrays.asList(files);

			if (files != null && files.length > 0) {
				for (File file : filesList) {

					if (file.getName().startsWith(fileName)) {
						fileListNames.add(file.getAbsolutePath());
					}
					if (file.isDirectory()) {
						searchFileRecursively(file.getAbsolutePath(), fileName,
fileListNames);
					}
				}
			}
		}

		public static void deleteFileRecursively(String path) {

			File currFile = new File(path);
			File[] files = currFile.listFiles();
			if (files != null && files.length > 0) {
				for (File file : files) {
					String fileName = file.getName() + " at " + file.getParent();
					if (file.isDirectory()) {
						deleteFileRecursively(file.getAbsolutePath());
					}

					if (file.delete()) {
						System.out.println(fileName + " deleted successfully");
					} else {
						System.out.println("Failed to delete " + fileName);
					}
				}
			}

			String currFileName = currFile.getName() + " at " + currFile.getParent();
			if (currFile.delete()) {
				System.out.println(currFileName + " deleted successfully");
			} else {
				System.out.println("Failed to delete " + currFileName);
			}
		}
	}
```

Unique Selling Points of the Application.

1. The application is designed to keep on running and taking user inputs even after exceptions occur.
2. To terminate the application, appropriate option needs to be selected.
3. The application can take any file/folder name as input.
4. User is also provided the option to write content if they want into the newly created file.
5. The application also allows user to delete files.
6. The user is able to seamlessly switch between options or return to previous menu.

Conclusion

Further enhancements to the application can be made which may include:

- Conditions to check if user is allowed to delete the file or add the file at the specific locations.
- Retrieving files/folders by different criteria like Last Modified, Type, etc.
- Allowing user to append data to the file.