Advance Programming - CPIT305

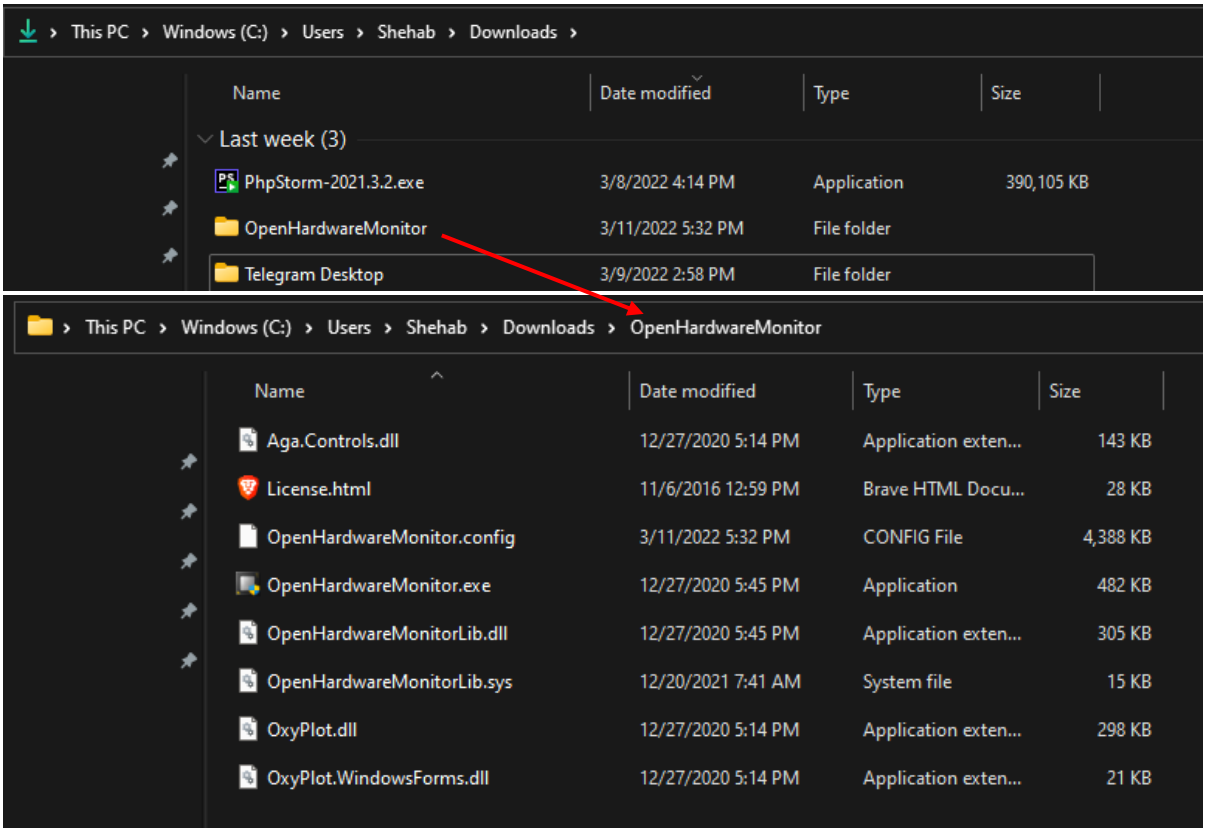
# HOMEWORK_1

Shehab

# CONTENTS

## 1- MAIN CLASS

```java
package com.CodeWithShehab;

public class Main {

    public static void main(String[] args) {
        new FileData("C:\\Users\\Shehab\\Downloads\\OpenHardwareMonitor").getData();
    }
}
```




Main class with the files that the program will execute on.

Note: Project has been created using **Intellij idea** not **NetBeans** so it might not be executable on NetBeans.

## 1- FILEDATA CLASS

```
package com.CodeWithShehab;

import java.io.File;
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.PrintWriter;
import java.nio.file.Files;
import java.nio.file.Paths;
import java.nio.file.attribute.BasicFileAttributes;
public class FileData {
    private File path;
    private BasicFileAttributes attr;

    public FileData(String path) {
        this.path = new File(path);
        if (!this.path.exists()) {
            try {
                throw new FileNotFoundException("File Not Found!");
            } catch (FileNotFoundException e) {
                System.err.println(e.getMessage());
                // so the program stops
                System.exit(0);
            }
        }
        try {
            attr = Files.readAttributes(Paths.get(this.path.getAbsolutePath()),
BasicFileAttributes.class);
        } catch (IOException e) {
            e.printStackTrace();
        }
    }

    public void getData() {
        PrintWriter print = null;
        try {
            print = new PrintWriter(new File("output.txt"));
        } catch (FileNotFoundException e) {
            e.printStackTrace();
        }
        if (path.isFile()) {
            print.println("> File name is             : " + path.getName());
            print.println("> File type                : File");
            print.println("> Created in               : " + attr.creationTime());
            print.println("> Last accessed in         : " + attr.lastAccessTime());
            print.println("> Last modified in         : " + attr.lastModifiedTime());
            print.println("> Hash using MD5 algorithm : " +
MD5Checksum.getMD5Checksum(path.getAbsolutePath()));
            try {
                print.println("> Size                     : " +
(Files.size((path.toPath()))) * 0.001 + " KB");
            } catch (IOException e) {
                e.printStackTrace();
            }
            print.println("> is File readable?          " + path.canRead());
            print.println("> is File writable?          " + path.canWrite());
            print.println("> is File executable?        " + path.canWrite());
            print.println("****************************************");

        } else {
            File[] fileArray = path.listFiles();
            for (int i = 0; i < fileArray.length; i++) {
                String fileType = "";
                if (fileArray[i].isDirectory())
                    fileType = "Directory".toUpperCase();
                else
                    fileType = "File".toUpperCase();
                print.println("> File name is             : " + fileArray[i].getName());
                print.println("> File type                : " + fileType);
                print.println("> Created in               : " + attr.creationTime());
```

```
                print.println("> Last accessed in         : " + attr.lastAccessTime());
                print.println("> Last modified in         : " + attr.lastModifiedTime());
                try {
                    print.println("> Size                     : " +
(Files.size((path.toPath()))) * 0.001 + " KB");
                } catch (IOException e) {
                    e.printStackTrace();
                }
                print.println("> Hash using MD5 algorithm : " +
MD5Checksum.getMD5Checksum(fileArray[i].getAbsolutePath()));
                print.println("> is File readable?          " + fileArray[i].canRead());
                print.println("> is File writable?          " + fileArray[i].canWrite());
                print.println("> is File executable?        " + fileArray[i].canWrite());
                print.println("****************************************");
            }
        }
        print.close();
    }
}
attr.lastModifiedTime());
                try {
                    System.out.println("> Size                     : " +
(Files.size((path.toPath()))) * 0.001 + " KB");
                } catch (IOException e) {
                    e.printStackTrace();
                }

                System.out.println("> Hash using MD5 algorithm : " +
MD5Checksum.getMD5Checksum(fileArray[i].getAbsolutePath()));
                System.out.println("> is File readable?          " +
fileArray[i].canRead());
                System.out.println("> is File writable?          " +
fileArray[i].canWrite());
                System.out.println("> is File executable?        " +
fileArray[i].canWrite());
                System.out.println("****************************************");
            }
        }
    }
}
```

This class has 2 fields

### 1- FILE OBJECT

To store the path

### 2- BASICFILEATTRIBUTES OBJECT

Because this class can bring (Creation time, Last access time, Last modified time) of the file/directory. The output for each file will be at the output section at the end document.

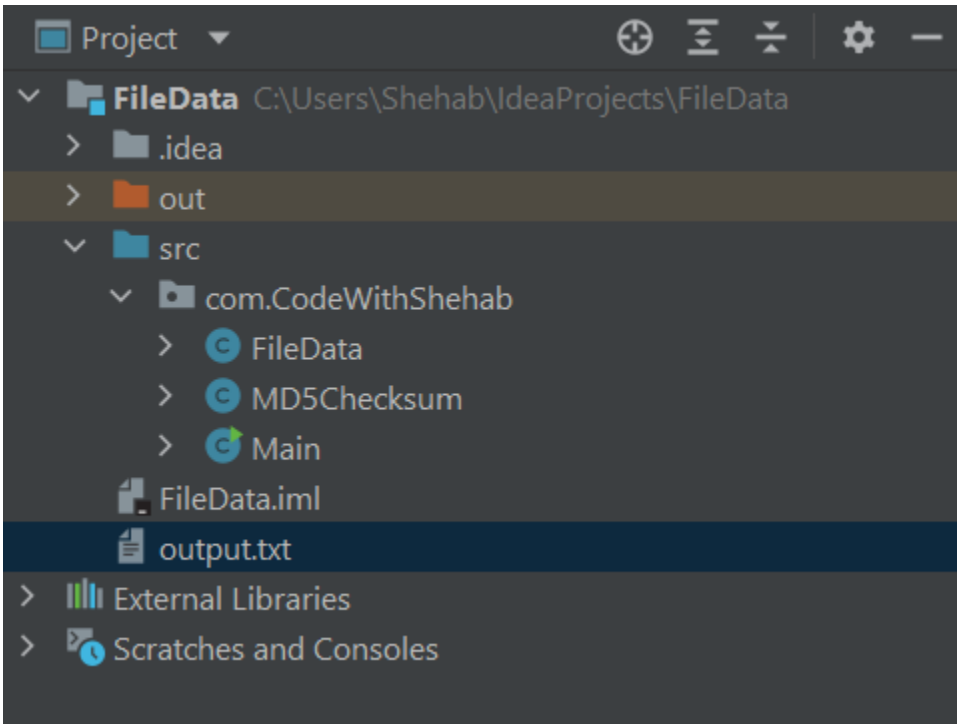
getData() -> One method only to bring the data.

## 3- MD5CHECHSUM CLASS

```
package com.CodeWithShehab;

import java.io.*;
import java.security.MessageDigest;
import java.security.NoSuchAlgorithmException;

public class MD5Checksum {
    public static byte[] createChecksum(String filename) {
        InputStream fis = null;
        try {
            fis = new FileInputStream(filename);
        } catch (FileNotFoundException e) {
            e.printStackTrace();
        }

        byte[] buffer = new byte[1024];
        MessageDigest complete = null;
        try {
            complete = MessageDigest.getInstance("MD5");
        } catch (NoSuchAlgorithmException e) {
            e.printStackTrace();
        }
        int numRead =0;

        do {
            try {
                numRead = fis.read(buffer);
            } catch (IOException e) {
                e.printStackTrace();
            }
            if (numRead > 0) {
                complete.update(buffer, 0, numRead);
            }
        } while (numRead != -1);

        try {
            fis.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
        return complete.digest();
    }

    // see this How-to for a faster way to convert
    // a byte array to a HEX string
    public static String getMD5Checksum(String filename) {
        byte[] b = createChecksum(filename);
        String result = "";

        for (int i=0; i < b.length; i++) {
            result += Integer.toString( ( b[i] & 0xff ) + 0x100, 16).substring( 1 );
        }
        return result;
    }
}
```

This class I've found it on Stackoverflow website it does calculate the hash using MD5 algorithm, I haven't change much in it I just managed the exceptions.

## 4- OUTPUT




Main.java | FileData.java | output.txt | MD5Checksum.java

```
> File name is              : Aga.Controls.dll
> File type                 : FILE
> Created in                : 2021-03-20T03:16:59.775469Z
> Last accessed in          : 2022-03-14T14:39:39.1462703Z
> Last modified in          : 2022-03-11T14:32:01.7155446Z
> Size                      : 4.096 KB
> Hash using MD5 algorithm : f17be368ade3f7cfbb6aa9dd734ce328
> is File readable?           true
> is File writable?           true
> is File executable?         true
*****************************************
```

The output will be saved in a text file inside the project using PrintWriter Object.

Thanks.

## 5- REFRENCE

1- https://stackoverflow.com/questions/304268/getting-a-files-md5-checksum-in-java Accessed date : 13/3/2022