CS1101 Programming and Problem Solving

Dr. Gina Bai

Spring 2023

Logistics

- **ZY-5B** on **zyBook > Assignments**
  - Due: **Wednesday, March 8**, at 11:59pm
- **PA07 – W, A, B** on **zyBook > Chap 11**
  - Due: **Thursday, March 9**, at 11:59pm
- **ZY-6** on **zyBook > Assignments**
  - Due: **Monday, March 20**, at 11:59pm

Logistics

- Monday, March 6
  - More file input coding practice
- Wednesday, March 8
  - Overview of Exam 2, File Output
- Friday, March 10
  - No class
- Monday, March 20
  - Review of Exam 2
- Wednesday, March 22
  - Exam 2

Recap – File Input

- **Step 1:** Specify the **file path** as a **String** object

```
String fileName = "data.txt";
```

- **Step 2:** Construct a **File** object to get the information about a file on the disk

```
import java.io.File;
File inputFile = new File(fileName);
```

- **Step 3:** Construct a **Scanner** object o read the file

```
import java.util.Scanner;
Scanner fileScnr = new Scanner(inputFile);
```

Recap – File Input

- **Token-based Processing:**

  While there's a token (or some other conditions are true), process the token

```
String token = fileScnr.next(); // OR nextInt(), nextDouble()
```

- **Line-based Processing:**

  While there's a line (or some other conditions are true), process the line

```
String line = fileScnr.nextLine();
Scanner lineScnr = new Scanner(line); // Tokenize the String if needed
```

Coins
JAVA File

coins1
Text File

coins2
Text File

Q: Write a program named Coins.java that

- reads an input file whose data represents a person's money grouped into stacks of coins
- adds up the cash values of all the coins, and
- prints the total money at the end.

Token-based

The input consists of a series of pairs of tokens, where each pair **begins with an integer and is followed by the type of coin**, which will be either "pennies" (1 cent each), "nickels" (5 cents each), "dimes" (10 cents each), or "quarters" (25 cents each), case-insensitively. A given coin might appear more than once on the same line.

coins1.txt:
3 pennies 2 quarters 1 pennies 3 nickels 4 dimes

Console output: Total money: $1.09

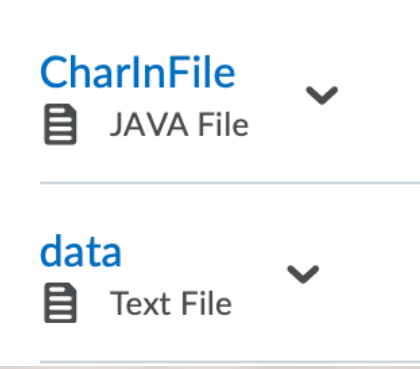
coins2.txt:
12 QUARTERS 1 Pennies 33 PeNnIeS

10 niCKELs

Console output: Total money: $3.84

```java
import java.io.*;
import java.util.Scanner;

public class Coins {
    public static void main(String[] args) throws FileNotFoundException {

        Scanner fileScnr = new Scanner(new File("coins1.txt")); // OR "coins2.txt"

        double totalCents = 0;

        while(fileScnr.hasNext()) {
            int num = fileScnr.nextInt();
            String coinType = fileScnr.next();

            if (coinType.equalsIgnoreCase("pennies")){
                totalCents += num;
            } else if (coinType.equalsIgnoreCase("nickels")) {
                totalCents += num * 5;
            } else if (coinType.equalsIgnoreCase("dimes")) {
                totalCents += num * 10;
            } else if (coinType.equalsIgnoreCase("quarters")) {
                totalCents += num * 25;
            }
        }
        fileScnr.close();
        System.out.println("Total money: $" + totalCents/100);
    }
}
```

Sample Solution



Q: Consider a file called data.txt that has the following contents:

Spring'23: CS 1101

Fall 24 -

CS2201

```
$ javac CharInFile.java
$ java CharInFile
Line 1 contains 6 digits, 3 uppercase letters, 5 lowercase letters, and 3 spaces.
Line 2 contains 2 digits, 1 uppercase letters, 3 lowercase letters, and 11 spaces.
Line 3 contains 4 digits, 2 uppercase letters, 0 lowercase letters, and 0 spaces.
```

Write a program named CharInFile.java that counts and prints

1) the number of digits in each line
2) the number of uppercase letters in each line
3) the number of lowercase letters in each line
4) the number of spaces in each line

Line-based

Sample Solution

```java
import java.io.*;
import java.util.Scanner;

public class CharInFile {
    public static void main(String[] args) throws FileNotFoundException {

        Scanner fileScnr = new Scanner(new File("data.txt"));

        int lineCounter = 1;

        while(fileScnr.hasNextLine()){

            String line = fileScnr.nextLine();

            int numDigit = 0, numUpper = 0, numLower = 0, numSpace = 0;

            for (int i = 0; i < line.length(); ++i) {
                char temp = line.charAt(i);

                if(Character.isDigit(temp)) {
                    numDigit++;
                } else if (Character.isUpperCase(temp)) {
                    numUpper++;
                } else if (Character.isLowerCase(temp)) {
                    numLower++;
                } else if (temp == ' '){
                    numSpace++;
                }
            }

            System.out.println("Line " + lineCounter + " contains " +
                               numDigit + " digits, " + numUpper + " uppercase letters, " +
                               numLower + " lowercase letters, and " + numSpace + " spaces.");

            ++lineCounter;
        }
        fileScnr.close();
    }
}
```