Assignment 1

Problem statement & Analysis and design notes
The problem involves scanning in the user's input, and checking it with an alphabet character array. Firstly upon loading of the program the user should be prompted with the option of going through the alphabet forward or backwards, and then arranging the alphabet based on the provided option.
Then with a for loop loop through the characters in the alphabet, and handle such events where the user enters the wrong character. Once the for loop finishes the program should end and provide the time taken for the user.

```
We will need a char array for the characters of the alphabet
```

```
private char[] alphabet = { 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i',
'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q','r', 's','t', 'u', 'v', 'w', 'x',
'y', 'z' };
```

```
After that using a switch, we determine which way to arrange the alphabet.
```

```
switch(ch){
        case 'f':
                // forward code
                // alphabet array stays the same
        case 'b':
                // backward code
                // alphabet array reverses
        default:
                // User entered wrong character, ask user to re-enter
}
```

Then we start the timer

```
// starting a timer
long begin = System.currentTimeMilis();
// other code

// ending timer
long end = System.currentTimeMillis();
float time = (float) (end - begin) / 1000;
```

Main part

```
// for loop looping through alphabet character array
for(int i = 0; i < character array; i++){
        char input = scanner.next();
        if(input != character_array[i]){
                // The character entered was incorrect,
                // Decrement i,
                i--;
        }
}
```

Code

```
import java.util.Scanner;
/*
* @Author: Dawid Szczesny
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* @Date: 13/01/2023
*/
class MyApp {

// creating alphabet array
private char[] alphabet = { 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i',
'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q','r', 's','t', 'u', 'v', 'w', 'x',
'y', 'z' };

// Constructor
public MyApp() {
// Instructions for user
System.out.println("Type the alphabet in order (hit enter between each
letter)");
Scanner scanner = new Scanner(System.in);
System.out.print("Forwards or backwards? (f / b): ");

// takes in a character and converts it to lower case
char alphaOrder = scanner.next().toLowerCase().charAt(0);

// switch case syntax to determine whether the user goes forwards or
backwards
switch (alphaOrder) {
        case 'f':
                // user chose to type the alphabet forwards
                System.out.println("You are typing the alphabet forwards!");
                break;
```

```
        case 'b':
                // We reverse in alphabet array as we are going backwards
                char[] temp = new char[26]; // creates new temp array
                // loop through each letter in alphabet array from back to
front
                // appending each one to temp
                for (int i = 0; i < alphabet.length; i++) {
                        temp[i] = alphabet[alphabet.length - 1 - i];
                }
                // set alphabet to temp
                alphabet = temp;
                System.out.println("You are typing the alphabet
backwards!");
                break;

        default:
                System.out.println("Character must be either a f or b");
                alphaOrder = scanner.next().toLowerCase().charAt(0);
                break;
}

// ------------------ Game Part -------------------------------
// this is where our time will begin
long begin = System.currentTimeMillis();

for (int i = 0; i < alphabet.length; i++) {
        System.out.println("Type \'" + alphabet[i] + "\' now");
        // Accepts both lower case and upper case letters, by coverting them
to
        // lowercase
        char input = scanner.next().toLowerCase().charAt(0);

        // checking if character is incorrect
        // if it is we cancel out the increment of i in the for loop
        // let the user know that it was incorrect
        // continue on with the for loop
        if (input != alphabet[i]) {
                i--;
                System.out.println("incorrect");
                continue;
        }
}


// congratulates the user and calculates time
System.out.println("Well done!");
```

```
long end = System.currentTimeMillis();
float time = (float) (end - begin) / 1000; // using float to not lose
decimal
System.out.printf("Time taken: %.3f seconds\n", time); // cutting off at 3
decimal places
scanner.close(); // closes scanner once we are done

}

// Main method
// Creates instance of app and runs constructor
public static void main(String[] args) {
        MyApp app = new MyApp();
}
}
```

Testing