Assignment 1: Speed test for typing the letters of the alphabet

In this assignment, you will write a program for reading in the letters of the alphabet, one at a time, in order from the console. The user should press enter between each letter and incorrect letters in the sequence should be *ignored*. Once the user has typed the letters in the correct sequence, the program should tell them how long it took to complete. The user can also decide if they would like to type the letters *forwards* or *backwards*.

Example output from the program is as follows:

Invalid Input:

```
Console ☒                                                                               ▬ ✖
<terminated> Alphabet [Java Application] C:\Program Files\Java\jre-10.0.1\bin\javaw.exe (15 Jan 2020, 11:46:04)
Type the alphabet in order (hit enter between letters)
Forwards or Backwards (f/b)?:No!
Invalid. You must enter either 'f' or 'b' to start.
```

Forwards is chosen:

```
Console ☒                                                                               ▬ ✖
<terminated> Alphabet [Java Application] C:\Program Files\Java\jre-10.0.1\bin\javaw.exe (14 Jan 2020, 11:29:41)
Type the alphabet in order (hit enter between letters)
Forwards or Backwards (f/b)?:f
a
[a: Correct! Now type b]
b
[b: Correct! Now type c]
c
[c: Correct! Now type d]
d
[d: Correct! Now type e]
e
[e: Correct! Now type f]
f
[f: Correct! Now type g]
g
[g: Correct! Now type h]
h
[h: Correct! Now type i]
i
[i: Correct! Now type j]
j
[j: Correct! Now type k]
k
[k: Correct! Now type l]
l
[l: Correct! Now type m]
m
[m: Correct! Now type n]
n
[n: Correct! Now type o]
o
[o: Correct! Now type p]
p
[p: Correct! Now type q]
q
[q: Correct! Now type r]
r
[r: Correct! Now type s]
s
[s: Correct! Now type t]
t
[t: Correct! Now type u]
u
[u: Correct! Now type v]
v
[v: Correct! Now type w]
w
[w: Correct! Now type x]
x
[x: Correct! Now type y]
y
[y: Correct! Now type z]
z
[Correct! Well done!]

Time taken: 11.648 seconds
```

Backwards is chosen:

```
Type the alphabet in order (hit enter between letters)
Forwards or Backwards (f/b)?:b
z
[z: Correct! Now type y]
y
[y: Correct! Now type x]
x
[x: Correct! Now type w]
w
[w: Correct! Now type v]
v
[v: Correct! Now type u]
u
[u: Correct! Now type t]
t
[t: Correct! Now type s]
s
[s: Correct! Now type r]
r
[r: Correct! Now type q]
q
[q: Correct! Now type p]
p
[p: Correct! Now type o]
o
[o: Correct! Now type n]
n
[n: Correct! Now type m]
m
[m: Correct! Now type l]
l
[l: Correct! Now type k]
k
[k: Correct! Now type j]
j
[j: Correct! Now type i]
i
[i: Correct! Now type h]
h
[h: Correct! Now type g]
g
[g: Correct! Now type f]
f
[f: Correct! Now type e]
e
[e: Correct! Now type d]
d
[d: Correct! Now type c]
c
[c: Correct! Now type b]
b
[b: Correct! Now type a]
a
[Correct! Well done!]

Time taken: 10.767 seconds
```

Incorrect letter in the sequence:

```
Type the alphabet in order (hit enter between letters)
Forwards or Backwards (f/b)?:f
a
[a: Correct! Now type b]
b
[b: Correct! Now type c]
d
o
h
!
c
[c: Correct! Now type d]
d
[d: Correct! Now type e]
```

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General Notes:

- This assignment will involve some research on your part. For example:
    - Scanning input from the user, specifically individual characters
    - Working with the char primitive data type and an array of this type
    - How to record the time taken and display it (in seconds)
    - Determining the most suitable loop construct and identifying the stopping conditions
    - Iteration through the array in both directions (try to avoid having more than one array)
- You can use any approach you like from once it achieves the functionality described above
    - Keep in mind that you will lose marks for inefficient or unnecessarily repetitive code

Submission Notes:

- You should submit a *single PDF document* (and the Java file(s)) with the following sections:
    - Problem Statement with Analysis and Design Notes (6 Marks)
        - Describe the problem. Before you begin coding, you should analyse the overall problem and create design notes for yourself. This can include identifying methods that will be required (if any), writing basic pseudocode and outlining the flow of control for the program. You can then use this as a guide when you begin programming.
    - Code (18 Marks)
        - **IMPORTANT**: You must copy and paste your code as text into this section
        - **If you submit a screenshot of the code you will receive 0 marks.**
        - Your code must also contain plenty of *meaningful* comments to fully describe the functionality of each part.
        - Any form of plagiarism with be taken very seriously.
    - Testing (6 Marks)
        - You should extensively test each aspect of the code and provide screenshots of the testing output. You may also wish to include a table listing tests with expected and actual results.

Deadline:

- You have a single lab session to complete this assignment. It is highly recommended that you attempt to code the solution before your first lab and then you can use the lab to ask questions.
    - Due Date: **Wednesday the 25th of January @ 11.59pm**
    - Any element of plagiarism detected will result in receiving 0 marks.