# Overview

In this lab, you will practice reading and writing `string`s to the console using the `System.Console` class. Additionally, you will use `string` and `System.Array` methods to manipulate these `string`s as you process them.

One thing to note—`string`s in *C#* are *immutable*. This means that you cannot change a `string` once it has been created. Methods that appear to alter a `string`'s contents are actually returning a *new* `string`. In contrast, many of the `System.Array` methods alter the affected arrays in-place. You may need to consider these behaviors as you create and use variables to store your data.

The content necessary to complete the Lab is found in Chapter 2 of *Essential C# 6.0* by Mark Michaelis. Some key methods to consider are:

- `string` **instance methods:** *`string`*`.ToLower()`, *`string`*`.ToUpper()`, *`string`*`.ToCharArray()`, and *`string`*`.Replace()`
- `System.Array` **class methods:** `System.Array.Reverse(`*`array`*`)` and `System.Array.Sort(`*`array`*`)`

**Finally, note that all of the tasks below require no conditionals or loops. This means that full credit is given only for solutions that do not use `if` or `while`/`for` keywords.**

# Instructions

## PART I

1. Ask for a sentence or phrase, and store as string variable named `phrase`.
2. Write the following to the console. Label each output:
   (a) The original `string`
   (b) The `string` in all lowercase characters
   (c) The `string` in all uppercase characters
   (d) All of the words in the `string`, each on its own line ending with a comma. (You can assume that no punctuation occurs in the phrase.)
   (e) Whether or not the phrase is a palindrome. Do not consider spaces or upper- *vs.* lowercase when checking for palindromes.
   (f) The `string` sorted so that *a* comes before *b* comes before *c*... This should be case sensitive, so: "Northern Vermont University" → "NUVeeehiimnnnoorrrrstttvy"

## Part II

1. Ask for a character, and store as an uppercase `char` named `originalChar`. If multiple characters are entered, just use the first.
2. Ask for an offset (an integer between 0 and 25, inclusive.)
3. Rotate the character by the offset. So, if the original character is `'A'` and the offset is 2, the rotated character is `'C'`. However, is the original character is `'Z'`, then the rotated character would be `'B'`. Name this `rotatedChar`.
4. Write the following to the console. Label each output:
   (a) The original character, the offset, and the rotated character in the format: "`originalChar` rotated by `offset` is `rotatedChar`."

# Example Output / Test Cases

## Test Case 1:

```
Enter a sentence or phrase (no punctuation): Do North
ORIGINAL STRING: "Do North"
LOWERCASE STRING: "do north"
UPPERCASE STRING: "DO NORTH"
COMMA-DELIMITED WORDS:
Do,
North
"Do North" is a palindrome: False
SORTED STRING: " DNhoort"
Enter a character: B
Enter an offset (integer in range 0 to 25): 0
B rotated by 0 is B.
Press any key to continue . . .
```

## Test Case 2:

```
Enter a sentence or phrase: Able was I ere I saw Elba
ORIGINAL STRING: "Able was I ere I saw Elba"
LOWERCASE STRING: "able was i ere i saw elba"
UPPERCASE STRING: "ABLE WAS I ERE I SAW ELBA"
COMMA-DELIMITED WORDS:
Able,
was,
I,
ere,
I,
saw,
Elba
"Able was I ere I saw Elba" is a palindrome: True
SORTED STRING: "      AEIIaaabbeeellrssww"
Enter a character: x
Enter an offset (integer in range 0 to 25): 5
X rotated by 5 is C.
Press any key to continue . . .
```

## Test Case 3:

```
Enter a sentence or phrase (no punctuation): Sir I soon saw Bob was no Osiris
ORIGINAL STRING: "Sir I soon saw Bob was no Osiris"
LOWERCASE STRING: "sir i soon saw bob was no osiris"
UPPERCASE STRING: "SIR I SOON SAW BOB WAS NO OSIRIS"
COMMA-DELIMITED WORDS:
Sir,
I,
soon,
saw,
Bob,
was,
no,
Osiris
"Sir I soon saw Bob was no Osiris" is a palindrome: True
```

```
SORTED STRING: "       BIOSaabiiinnoooorrssssssww"
Enter a character: A
Enter an offset (integer in range 0 to 25): 13
A rotated by 13 is N.
Press any key to continue . . .
```

## Submission

You will fork the starter code given in the repl.it project, modify it, and share with me.