

HW 06: ArrayBuilder

Release date: Friday, October 7th, 2016

Due date: Friday, October 14th, 2016 – 11:59 pm

Goals

- Learn to create and transverse 2-dimensional arrays

Description

The goal of this homework is to build an array containing alphabet letters in a special order. The program will start by asking a user for a base letter in the alphabet (it could be any letter, either capitalized or in lower case) and the dimensions of the array: number of rows (n) and number of columns (m). Then, it will populate an array $n \times m$ that has the base letter in the leftmost corner (0x0 position) and fills the rest of the array with additional letters following a specific order:

- Each letter should be followed by its consequent letter in the alphabet in both vertical and horizontal directions.
- Horizontally, the order goes from left to right, following the array indexes.
- Vertically, the order goes from top to bottom, following the array indexes.

For example, if the base letter is A and the array is of 5x5, the resulting array should look like this.

A	B	C	D	E
B	C	D	E	F
C	D	E	F	G
D	E	F	G	H
E	F	G	H	I

Where A is followed by B both horizontally (going right) and vertically (going down), B is followed by C, and so on. Once we reach Z, the next letter should be A again, following a circular manner.

If the base letter is y and the array is of 4x6, the resulting array should look like this:

y	z	a	b
z	a	b	c
a	b	c	d
b	c	d	e
c	d	e	f
d	e	f	g

The ArrayBuilder class

Model this problem in a class called `ArrayBuilder`. To create a *new* instance of an array builder you will need the base letter and the dimensions of the array. The prototype of the constructor is, thus:

```
public ArrayBuilder(char baseLetter, int n, int m)
```

The constructor should take care of initializing the variables needed to represent this problem: the 2-D char array (name it `letterArray`) and the base letter.

Next, you will create a method:

```
public void build()
```

This method will build the array using the specifications explained in the problem description.

Additionally, you will create a method:

```
public char[][] getLetterArray()
```

to return a **copy** of the array that you have built. Keep in mind that returning the reference to your instance variable and returning a copy of the array are different things.

Finally, create a helper method:

```
public void printLetterArray()
```

to visualize the contents of your array and test the correctness of your program. You are free to choose the way to print this. Use a simple main method to make **several different** calls to your `ArrayBuilder` and observe the output of your program after a call to `build()`. You are also encouraged to write your own test cases.

Rubric

- 10% Constructor
- 10% `getLetterArray`
- 80% `build`

Submission

Submit all your files to [Vocareum](#) by following [these instructions](#). Keep in mind that there is a limit of 20 submissions and only your last submission will be considered.

Good Luck