Skill Builder 5 - Arrays

The i^{th} Prefix Average

The i^{th} prefix average of an array, `a`, is defined as the average of the first $i + 1$ elements of the array.

$$p[i] = \frac{a[0] + a[1] + a[2] + \cdots + a[i]}{i + 1}$$

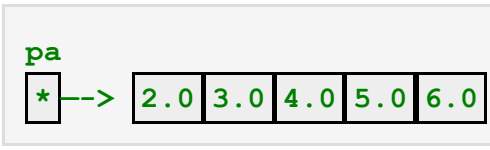
(**See README.pdf for a rendering of equations**) Where p is the prefix average array and $p[i]$ is the i^{th} prefix average. Such prefix averages have applications in financial analysis. The SkillBuilder5 class below has a template method,

```
public static double[] prefixAverage(double[] data)
```

Implement the method so that it returns an array containing the prefix averages. Consider for example,

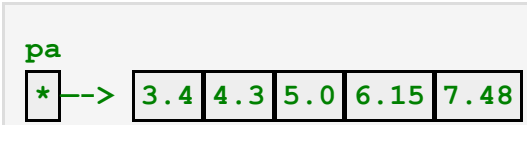
```
double[] myDatum = {2, 4, 6, 8, 10};
double[] pa = SkillBuilder5.prefixAverage(myDatum);
```

The array `pa` will contain the following prefix average values:



For another example,

```
double[] myDatum = {3.4, 5.2, 6.4, 9.6, 12.8};
double[] pa = SkillBuilder5.prefixAverage(myDatum);
```



Searching an Array

The SkillBuilder5 class below contains a method with the following signature,

```
public static int  indexOf(int searchValue, int[] anArray)
```

Implement the method so that it takes an integer argument, `searchValue`, and an integer array, `anArray` and returns an integer that is the index of the first occurrence of `searchValue` in `anArray`.

For example,

```
int loc = SkillBuilder5.indexOf(5, {8,99,45,5,34,87,5,22,1})
```

should result in a `3` returned and assigned to `loc`.

Searching an Array of Strings

The SkillBuilder5 class below contains a method with the following signature,

```
public static int  indexOf(String s, String[] anArray)
```

Implement the method so that it takes a String argument, `s`, and returns an integer that is the index of the first occurrence of the String `s` in `anArray`.

For example,

```
int loc = SkillBuilder5.indexOf("python", {"za","hello","bye","anaconda",
"python","pycharm","python"});
```

should result in `4` returned and assigned to `loc`.

Remove an Item From an Array

The SkillBuilder5 class below contains a method with the following signature,

```
public static String[] remove(String s, String[] anArray)
```

Implement this method so that after invoking this method, all occurrences of `s` in array `anArray` are removed leaving all remaining elements in the array in the same sequence.

For example,

```
String[] myArray = {"French","English","Spanish","Greek","Russian","Spani
sh"};
myArray = SkillBuilder5.remove("Spanish",myArray)
```

results in the array `myArray` having the following elements,

Notice that the method `remove()` returns a completely new array containing all the original elements except those matching `s`.

Let's Reverse It!

The SkillBuilder5 class below contains a method with the following signature,

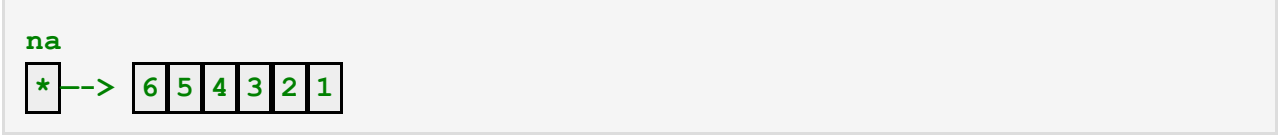
```
public static void reverse(int[] anArray)
```

Implement this method so that the contents of array `anArray` are reversed. In other words, the first element becomes the last element and the last element becomes the first element, the second element becomes the second to the last element and the second to the last element becomes the second element, and so on.

For example,

```
int[] na = {1,2,3,4,5,6};
SkillBuilder5.reverse(na);
```

The result is that the array `na` now looks like,



Notice again that the method `reverse()` has the side effect of modifying the array passed to

it! Another way of saying this is the method `reverse()` reverses the array in-place.