Names: _____

Swift: While Loops, For Loops, and Arrays - Group Assignment

Part 1: Modify Existing Code

The code below currently prints out all the numbers that are less than 1000, and are multiples of 5. Specifically, it will print out 5, 10, 15, …, 990, 995.

First, read the code so you understand how it works.

Then, rewrite the code to make 2 changes: First, it should let the user input what maximum integer to use, instead of always using 1000. Second, it should print numbers that are either multiples of 3 or multiples of 5.

To remember how to read input from the user, feel free to look this up in lecture slides or other resources.

```
for n in 1..<1000 {
     if n % 5 == 0 {
          print(n)
     }
}
```

Source: projecteuler.net, Problem 1

Part 2: Sorting an Array

Here, we will experiment with creating a sorted array from an unsorted one. We will be doing this specifically with arrays of integers. For example, we will transform the array `[5, 3, 9, 7]` into `[3, 5, 7, 9]`. You are free to experiment with any algorithm to create a sorted array, but the one I will recommend, since it is easiest to understand, is insertion sort (https://en.wikipedia.org/wiki/Insertion_sort).

Insertion sort works like this: you start with your array that is unsorted, and a new array that is empty. Then, for each item in the unsorted array, you insert it into the correct position in the new array. To make the steps concrete, here is a table listing the values of the two arrays at each insertion step.

Action Taken	Unsorted Array	New Array
Original State	`[5, 3, 9, 7]`	`[]`
Insert 5	`[5, 3, 9, 7]`	`[5]`
Insert 3	`[5, 3, 9, 7]`	`[3, 5]`
Insert 9	`[5, 3, 9, 7]`	`[3, 5, 9]`
Insert 7	`[5, 3, 9, 7]`	`[3, 5, 7, 9]`

Your goal is to write the insertion sort algorithm in Swift. Below is some starter code for you, you just need to write the algorithm in the area mentioned in the comment. In addition, recall that to insert into an array, you can write: `theArray.insert(theValue, at: theIndex)`.

Starter code:

```
// For convenience we will use a constant array.
// But imagine this could be any array of any length.
let unsorted = [5, 3, 9, 7]
var sorted: [Int] = []

// Here is where you should implement insertion sort


print(sorted) // This should print [3, 5, 7, 9]
```