

# Email survey questions for Developers:

## Changing strings

Write a little program or method that takes in a string and reproduces the string in the following format:

- All vowels are lowercase
- All consonants are uppercase

For example, the following line in a code snippet

```
ChangeCase("alphabet");
```

Would produce:

```
aLPHaBeT
```

Bonus: (add the string "yesterday" to it - how does that change your answer)

## File/Folder Class structure

Create a simple set of object-oriented classes that represent a file-folder- like system, where folders and files can be:

- a. added,
- b. deleted
- c. report their name as well as the name of their children, and their children's children

For example, the Main function that uses the program might have the following code snippet in its Main() that uses these classes:

```
Folder Grandparent = new Folder("Grandparent");  
Folder Parent = new Folder("Parent");  
File ChildA = new File("ChildA");
```

```
ChildA.content = "This is the content for Child A";  
File ChildB = new File("ChildB");  
Folder ChildC = new Folder("ChildC");
```

```
File GrandChild = new File("GrandChild");  
ChildC.Add(GrandChild);  
Parent.Add(ChildA);  
Parent.Add(ChildB);  
Parent.Add(ChildC);  
Grandparent.Add(Parent);  
Grandparent.Display();  
ChildA.Display();
```

And, in this example, would produce on a console output (or similar to):

```
Grandparent  
Parent  
ChildA  
ChildB  
ChildC  
GrandChild  
This is the content for Child A
```

## Shuffle

Implement the following program named Shuffle:  
Output the integers 1...N in random order.

## Embedded Hardware Protocol

An autosampler is a hardware device that uses a single spindle motor to raise and lower an extendable gripper assembly, which extend and retract a pincher type gripper to grab and release sample tubes from a revolving carousel of tubes (in orange) and place them in the sample analyzer. (See simplified diagram arrows in black for motions possible)

There are sensors to detect the extreme positions of the motor and assemblies, as well as sensors to detect the presence of tubes in the carousel, gripper and analyzer (in diagram in red)

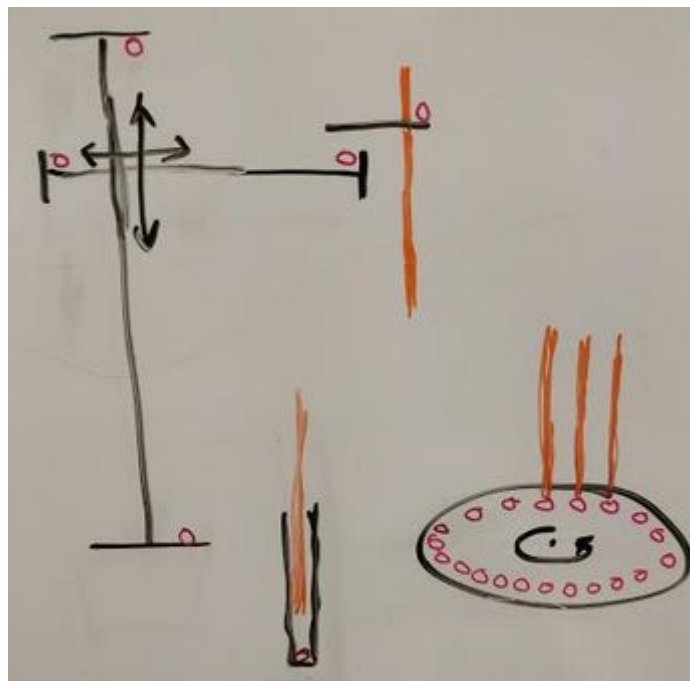
Please outline the protocol you would write a protocol that would safely take sample tubes from the carousel and place them in the analyzer, conduct analysis, and replace the tube.

All values for the sensors are binary (1 for contact or 0 for not in contact).

You can assume that tubes in the carousel can be detected for being present(1) or not (0).

You can also assume that the gripper positions for extracting the samples and placing them in the analyzer exist at the extremes of the contraction and extension where the sensors detect the motor.

Code, Pseudocode, or a structured algorithmic description in English is fine.



## Non-Technical Questions

What are the most important elements of making quality software, in your opinion?

What are the most important attributes of a software engineer or software developer?

What are the most important attributes of a software team?

What are the most important attributes of an organization that makes software?

How do you get through a situation where you are faced with solving a problem in a complex system and have only a limited amount of information?