

SQLI Technical Challenge

Please complete the challenges below. Try to provide as much information as possible with your code and how long it took you to do each task.

Challenge 1

Given two integer arrays of varying length, sorted ascending, as input, write a function that would output the two arrays merged. The output should still be sorted ascending and should not include duplicates. Here is an example:

```
a = [4, 6 , 7]
b = [3, 4]
c = sort(a,b);
output of c: [3 ,4, 6, 7]
```

Challenge 2

Write a thread-safe implementation of a class that follows the singleton pattern. The class should have one function which returns an input string reserved. Here is an example:

```
input: "test"
output: "tset"
```

Challenge 3

Write a web application which has a text box and a button. When the button is pushed the text in the text box should be sent to a service which accepts only json encoded messages. On receipt of the message the service should append the text to a file. Each text message should be on a new line in the file. Your solution should be what you consider production standards.

Challenge 4

Write a function which transposes a matrix. The matrix should be represented with a two-dimensional array of integers.

Example

```
(1 | 2 | 3      (1 | 4 | 7
4 | 5 | 6  becomes 2 | 5 | 8
7 | 8 | 9)      3 | 6 | 9)
```