Programming Challenge - 2021

Coding Instructions:

1. For **Questions 1 and 2**, code can be written in any programming language (**Java, Python, C or C++)** and for **Question 3**, any **RDBMS (Preferably SQL/Oracle/MySQL)** should be used.
2. Code needs to be properly commented. **Incomplete or partially commented code will not be evaluated**.
3. The solution along with the original code and screenshots of the results has to be shared to the email ID mentioned herein :
   recruiting@bbinsight.com
4. Preference will be given to those programs that have better performance and follow universal coding standards and are submitted before the deadline.

Question 1 – Replace Vowels with a digit

Question:

Replace all the vowels of the given input string with a single digit number.

Input:

String of length L and all lower-case letters.

Output:

Input String replaced with the digit.

Program explanation:

Replace all the vowels in the given input string with a single digit number you get after all the below steps.

Step 1: Get the index of the vowel in the given input.
Step 2: Multiply the index with 100.
Step 3: Sum all the prime numbers between 1 and the resulting number from last step.
Step 4: Add the digits of the number you get from the last step until you get a single digit.
Step 5: Now, Replace the vowel with the digit from the last step.

Example 1:

Input:

hello

Output:

h7ll9

Explanation:

Step 1: First vowel found at index 1.
Step 2: 1 * 100 = 100
Step 3: Sum of prime numbers between 1 and 100 is 1060
Step 4: Sum of each digit until we get single digit:
= 1 + 0 + 6 + 0
= 7
Step 5: Replace e with 7
Output now: h7llo
Step 1: Next vowel found at index 4.
Step 2: 4 * 100 = 400
Step 3: Sum of prime numbers between 1 and 400 is 13887
Step 4: Sum of each digit until we get single digit:
= 1 + 3 + 8 + 8 + 7
= 27
= 2 + 7
= 9
Step 5: Replace o with 9

Final output: h7ll9

Example 2:

Input : replace this

Output. : r7pl9c1 th5s

Question 2 – Minimum Swaps to Symmetric String

Question:

Given a lowercase alphabet string s, find the minimum number of swaps required to make it a symmetry string. If it's not possible, then return -1.

Constraints:

n ≤ 1,000 where n is length of s.

Example 1

Input

s = "aabb"

Output

2

Explanation

We can swap the middle "a" and "b" and then swap the first two "a" and "b" to get "baab".

Example 2

Input

s = "aab"

Output

1

Explanation

We can swap the middle "a" and "b" to get "aba".

Example 3

Input

s = "abca"

Output

-1

Explanation

No Possibilities.

Question 3 – SQL – Visits & Transactions

Write queries for the following scenarios and to retrieve the following information from the tables mentioned below

1. Max user visit date
2. Max amount transaction at a date
3. User with max transaction amount
4. Average transaction per day
5. User visited but did not do a transaction

Database Tables

-- **'Visits' table:**

```
-- +---------+------------+
-- | user_id | visit_date |
-- +---------+------------+
-- | 1       | 2020-01-01 |
-- | 2       | 2020-01-02 |
-- | 12      | 2020-01-01 |
-- | 19      | 2020-01-03 |
-- | 1       | 2020-01-02 |
-- | 2       | 2020-01-03 |
-- | 1       | 2020-01-04 |
-- | 7       | 2020-01-11 |
-- | 9       | 2020-01-25 |
-- | 8       | 2020-01-28 |
-- +---------+------------+
```

-- **'Transactions' table:**

```
-- +---------+------------------+--------+
-- | user_id | transaction_date | amount |
-- +---------+------------------+--------+
-- | 1       | 2020-01-02       | 120    |
-- | 2       | 2020-01-03       | 22     |
-- | 7       | 2020-01-11       | 232    |
-- | 1       | 2020-01-04       | 7      |
-- | 9       | 2020-01-25       | 33     |
-- | 9       | 2020-01-25       | 66     |
-- | 8       | 2020-01-28       | 1      |
-- | 9       | 2020-01-25       | 99     |
-- +---------+------------------+--------+
```

Note: For the last question (SQL), please create the table and write queries accordingly. You can upload the table data to any available database online and in addition to the source code, please provide screen shots of the output as well. Failure to provide so would mean, your solutions wouldn't be evaluated.

If you need any further information, please feel free to reach out to us at recruiting@bbinsight.com, Thank you!