ELITE SOFTWARE AND DATA SECURITY

ELITE EXAM

PHP

"SHORTEST WORD"

You have given a string of words, return the length of the shortest word(s).

String will never be empty, and you do not need to account for different data types.

TEST CASES:

      TEST CASE: "TRUE FRIENDS ARE ME AND YOU"

      OUTPUT: **2** – BECAUSE THE SHORTEST WORD IS "ME"

      TEST CASE: "I AM THE LEGENDARY VILLAIN"

      OUTPUT: **1** – BECAUSE THE SHORTEST WORD IS "I"

MY ANSWER:

TRUE FRIENDS ARE ME AND YOU

TEST CASE 1: TRUE FRIENDS ARE ME AND YOU

OUTPUT: 2

I AM THE LEGENDARY VILLAIN

TEST CASE 2: I AM THE LEGENDARY VILLAIN

OUTPUT: 1

"COUNT THE ISLANDS"

Implement an algorithm which analyzes a two-color image and determines how many isolated areas of a single color the image contains.

Islands

An "island" is a set of adjacent pixels of one color (1) which is surrounded by pixels of a different color (0). Pixels are considered adjacent if their coordinates differ by no more than 1 on the X or Y axis.

Below you can see an example with 2 islands:

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- on the left in the form of a matrix of 1's and 0's
- on the right in an equivalent stringified form using "X" and "~" characters for better readability

SAMPLE:

```
[
  [0,0,0,0,0,0,0,0,0,0],        "~~~~~~~~~~"
  [0,0,1,1,0,0,0,0,0,0],        "~~XX~~~~~~"
  [0,0,1,1,0,0,0,0,0,0],        "~~XX~~~~~~"
  [0,0,0,0,0,0,0,0,1,0],        "~~~~~~~~X~"
  [0,0,0,0,0,1,1,1,0,0],        "~~~~~XXX~~"
  [0,0,0,0,0,0,0,0,0,0],        "~~~~~~~~~~"
]
```

TEST CASE

GIVEN a 4x4 matrix.

```
[     1,1,1,1     ]
[     0,1,1,0     ]
[     0,1,0,1     ]
[     1,1,0,0     ]
```

Output: "XXXX"
        "~XX~"
        "~X~X"
        "XX~~"

MY ANSWER:

← C ⓘ localhost/PHPproblemcodes/CountIslands.php

TEST CASE 1: Input Matrix

```
1 1 1 1
0 1 1 0
0 1 0 1
1 1 0 0
```

OUTPUT:

```
* * * *
~ * * ~
~ * ~ *
* * ~ ~
```

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"WORD SEARCH"

You are given a word target and a list of sorted (by length(increasing), number of upper-case letters(decreasing), natural order) unique words; words which always contain target, your task is to find the index (0 based) of target in words, which would always be in the list.

MAX ARRAY LENGTH: 1000;

TEST CASES:

["I","TWO","FORTY","THREE",'JEN',"TWO","tWo","Two"];

TARGET = **"TWO"**
OUTPUT = **INDEX 1 and INDEX 5 // [1,5]**

MY ANSWER:

TEST CASE 1: Input Matrix

I TWO FORTY THREE JEN TWO tWo Two

OUTPUT: INDEXES: 1,5,

Array ([0] => 1 [1] => 5)

MYSQL:

NOTE: EXCEL / CSV FILE WILL BE PROVIDED

Based on the data given:

1. **Display total number of albums sold per artist**

```sql
SELECT artists.name AS Artist, COUNT(albums.id) AS TotalAlbumsSold FROM artists LEFT JOIN albums ON artists.id = albums.artist_id GROUP BY artists.name;
```

Artist	TotalAlbumsSold
(G)I-dle	
AB6IX	
aespa	1
Apink	1
ATEEZ	1
BAE173	1
BamBam	1
Bang Yongguk	1
Billlie	1
Blitzers	1
Bolbbalgan4	1
Brave Girls	1
BTOB	1
Cherry Bullet	1
Choi Yena	1
Cravity	1
Def.	1
DKZ	1
Dreamcatcher	1
Drippin	1
E'LAST	1
Enhypen	2
Epex	1
Epik High	1
Eric Nam	1

(Tooltip overlay: - Drag to reorder. - Click to mark/unmark. - Double-click to copy column)

2. **Display combined album sales per artist**

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```
SELECT artists.name AS Artist, SUM(albums.sales) AS CombinedSales FROM
 artists LEFT JOIN albums ON artists.id = albums.artist_id GROUP BY ar
tists.name;
```

Artist	CombinedSales
(G)I-dle	198589
AB6IX	43058
aespa	19629
Apink	58641
ATEEZ	3578
BAE173	16801
BamBam	87540
Bang Yongguk	6933
Billlie	66885
Blitzers	17719
Bolbbalgan4	2596
Brave Girls	33605
BTOB	121528
Cherry Bullet	20250
Choi Yena	84346
Cravity	123922
Def.	41148
DKZ	118583
Dreamcatcher	94706
Drippin	37535
E'LAST	48695
Enhypen	649016
Epex	71584
Epik High	5382
Eric Nam	2183

3. **Display the top 1 artist who sold most combined album sales**

```
SELECT artists.name AS Artist, SUM(albums.sales) AS CombinedSales FROM
 artists LEFT JOIN albums ON artists.id = albums.artist_id GROUP BY ar
tists.name ORDER BY CombinedSales DESC LIMIT 1;
```

Artist	CombinedSales
NCT Dream	1649993

4. **Display the top 10 albums per year based on their number of sales**

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✔ Showing rows 0 - 9 (10 total, Query took 0.0022 seconds.)

```sql
SELECT name, SUM(sales) AS TotalSales FROM albums GROUP BY name ORDER BY `TotalSales` DESC LIMIT 10
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

+ Options

←T→				name	TotalSales ▼ 1
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Glitch Mode	1649993
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Oddinary	1000088
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	The Second Step: Chapter One	668539
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Dimension: Answer	621425
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	The Reve Festival 2022: Feel My Rhythm	560838
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Love Dive	440067
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Ad Mare	406936
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	2021 Winter SMTOWN: SMCU Express	350331
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	Shape of Love	284668
☐	🖉 Edit	ᗌᴵ Copy	⊖ Delete	First Impact	271048

5. Display list of albums based on the searched artist

```sql
SELECT albums.name AS Album_Name, albums.year AS Album_Year, albums.sales AS
Album_Sales, albums.last_update AS Album_Last_Update, albums.cover_image AS A
lbum_Cover_Image FROM albums JOIN artists ON albums.artist_id = artists.id WH
ERE artists.name = 'Enhypen';
```

+ Options

Album_Name	Album_Year	Album_Sales	Albums_Last_Update	Album_Cover_Image
Dimension: Dilemma	211012	27591	220430	
Dimension: Answer	220110	621425	220430	

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LARAVEL

NOTE: SAME CSV FILE FROM MYSQL EXAM

MODELS

ARTISTS

FIELDS

CODE

NAME

FUNCTIONS

- read the full details of created artist

- update the full details of created artist

- delete the details of created artist

ALBUMS

FIELDS

YEAR

NAME

SALES

FUNCTIONS

- read the full details of album

- update

- delete
- add a picture of album cover

Migration and DB Relation

- use the csv file to populate the artist and albums and use "faker"
for the other details that is not in the csv file

Login

- admin user can perform logout functionality

- credentials must be username and password

Dashboard

- Display total number of albums sold per artist

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- Display combined album sales per artist

- Display the top 1 artist who sold most combined album sales

- Display list of albums based on the searched artist

Bonus:

- Translate each sql scripts to a Laravel eloquent format

- Provide routes for each scripts for each scenarios

- API: Output must be in json format

    - Provide an authentication function that will grant a bearer token that can be used to access the said routes

    Create API route under route.php in Laravel using the created controller on CRUD basic in above activity.
    - Endpoint Can perform GET, POST, PUT/PATCH, DELETE for
    - Artist
    - Album