Python [solutions]

Python and R for Data Science

Data Science and Management

Exercise 1: find number of unique characters

Define a function `count_uniq` that:

- takes as arguments:
    - a string `s`
- returns:
    - the number of unique characters in `s`

In [6]:
```
# Solution goes here
```

Test your code

Run this code to test your solution:

In [7]:
```
try: assert count_uniq("test") == 3 and count_uniq("Aejeje") == 3 and r
except: print('Test failed')
```

```
Test failed
```

Solution

In [1]:
```
def count_uniq(s):
    return len(set(s))

# test
assert count_uniq("test") == 3 and count_uniq("Aejeje") == 3 and not pr
```

```
Test passed
```

Exercise 2: remove duplicates

Define a function `remove_duplicates` that:

- takes as arguments:
    - a list `s` of strings
- returns:
    - a copy of `s` without duplicate elements

In [6]:
```
# Solution goes here
```

Test your code

Run this code to test your solution:

In [7]:
```
try: assert remove_duplicates(["test", "luiss", "data", "test", "scienc
except: print('Test failed')
```

```
Test failed
```

Solution

In [5]:
```python
def remove_duplicates(s):
    return list(set(s))

# test
assert remove_duplicates(["test", "luiss", "data", "test", "science"])
```

```
Test passed
```

Exercise 3: find common elements

Define a function `common_elements` that:

- takes as arguments:
    - a set `s` of strings
    - a set `k` of strings
- returns:
    - a list containing all common elements between `s` and `k`

In [8]:
```
# Solution goes here
```

Test your code

Run this code to test your solution:

In [9]:
```
friend1_companies = {'Google', 'Amazon', 'Apple', 'Microsoft'}
friend2_companies = {'Facebook', 'Google', 'Tesla', 'Amazon'}
try: assert common_elements(friend1_companies, friend2_companies) == {'
except: print('Test failed')
```

```
Test passed
```

Solution

In [10]:
```
def common_elements(s, k):
    return s.intersection(k)

# test
friend1_companies = {'Google', 'Amazon', 'Apple', 'Microsoft'}
friend2_companies = {'Facebook', 'Google', 'Tesla', 'Amazon'}
assert common_elements(friend1_companies, friend2_companies) == {'Googl
```

```
Test passed
```

Exercise 4: count word frequency

Define a function `word_freq` that:

- takes as arguments:
    - a string `s`
- returns:
    - a dictionary containing as key each word in `s` and as value the count of that word in `s`

Count the word case-insensitive.

In [12]:
```
# Solution goes here
```

Test your code

Run this code to test your solution:

In [13]:
```
try: assert word_freq("Python is fun and learning Python is fun") == {'
except: print('Test failed')
```

```
Test failed
```

Solution

In [12]:
```python
def word_freq(s):
    words = s.lower().split()
    word_count = {}
    for word in words:
        word_count[word] = word_count.get(word, 0) + 1
    return word_count

# test
assert word_freq("Python is fun and learning Python is fun") == {'pytho
```

```
{'python': 2, 'is': 2, 'fun': 2, 'and': 1, 'learning': 1}
Test passed
```

Exercise 5: track voting results

Define a function `update_votes` that:

- takes as arguments:
    - a dictionary `votes` having as key names of candidates and as value the number of votes received by each one of them
    - a list `new_votes` of names of candidates
- returns:
    - the `votes` dictionary updated with the new votes received

In [15]:
```
# Solution goes here
```

Test your code

Run this code to test your solution:

In [16]:
```
votes = {
    'Alice': 120,
    'Bob': 150,
    'Charlie': 90
}

new_votes = ['Alice', 'Charlie', 'Charlie', 'Bob', 'Alice', 'Alice']
try: assert update_votes(votes, new_votes) == {'Alice': 123, 'Bob': 151
except: print('Test failed')
```

```
Test failed
```

Solution

In [14]:

```python
def update_votes(votes, new_votes):
    for vote in new_votes:
        votes[vote] = votes.get(vote, 0) + 1
    return votes

# test
votes = {
    'Alice': 120,
    'Bob': 150,
    'Charlie': 90
}

new_votes = ['Alice', 'Charlie', 'Charlie', 'Bob', 'Alice', 'Alice']
assert update_votes(votes, new_votes) == {'Alice': 123, 'Bob': 151, 'Ch
```

```
Test passed
```