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### Junior Back-end Engineer Challenge

### Task 1: PlusMinusConversion

Write a function solution that, given a string S of length N, replaces all occurrences of "plus" with "+" and all occurrences of "minus" with "-".

#### Examples:

1. Given S = "minusplusminus", the function should return "-+-".
2. Given S = "plusminusminusplus", the function should return "+--+".

#### Assume that:

* N is an integer within the range [4..1,000];
* S is created by concatenating only strings "plus" and "minus".

In your solution, focus on correctness. The performance of your solution will not be the focus of the assessment.

**task1/solution.py:**

**def plus\_minus\_conversion(s):**

**"""replaces all occurrences of 'plus' with '+' and all occurrences of 'minus' with '-'"""**

**if isinstance(s, str):**

**operators = {**

**'plus': '+',**

**'minus': '-'**

**}**

**for op, symbol in operators.items():**

**if op in operators:**

**s = s.replace(op, symbol)**

**return s**

**else:**

**return 'Your input is not a string type!'**

### Task 2: DjangoRestPerson

You are required to create a REST API to retrieve a data list from a Person model.

#### Requirements

1. Fill the PersonSerializer class with the required code to implement the serializer for the API.
2. Fill the PersonViewSet class with the required code to implement the view.
3. The endpoint must be created to retrieve a list of data; it will not need to retrieve a singular record.
4. The data must be ordered by the created\_date field, and the first record to show in the response must be the newest record created.
5. The response from the API should only contain the first\_name, last\_name, email and created\_date fields.
6. Create an API that will only allow data to be read.

#### Assumptions

* You can assume that the Person model is correct and contains the required data in the database.
* The URL router is already defined in the path.
* The name of the API is persons.
* There is no need to create an authentication mode.

#### Hints

Your solution will be evaluated based on its correctness; performance and coding style will not be assessed.

#### Available packages/libraries

* Python 3.8
* Django 3.1
* Django Rest Framework 3.11.x

#### Examples

For the following data saved in the model:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Id** | **first\_name** | **last\_name** | **email** | **phone** | **created\_date** |
| 2001 | James | Smith | jamessmith@example.com | 3337001 | 2020-05-06 |
| 3001 | John | Doe | johndoe@example.com | 5555001 | 2020-09-08 |

the expected response in JSON format should be:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Id** | **first\_name** | **last\_name** | **email** | **created\_date** |
| 3001 | John | Doe | johndoe@example.com | 2020-09-08 |
| 2001 | James | Smith | jamessmith@example.com | 2020-05-06 |

**task1/models.py:**

**from django.db import models**

**class Person(models.Model):**

**# DO NOT EDIT**

**first\_name = models.CharField(max\_length=30)**

**last\_name = models.CharField(max\_length=30)**

**email = models.CharField(max\_length=30)**

**phone = models.CharField(max\_length=7)**

**created\_date = models.DateTimeField()**

**task1/serializers.py:**

**from rest\_framework import serializers**

**class PersonSerializer(serializers.HyperlinkedModelSerializer):**

**url = serializers.HyperlinkedIdentityField(view\_name="accounts:persons-detail")**

**class Meta:**

**model = Person**

**exclude = ('phone', )**

**read\_only\_fields = ('first\_name', 'last\_name', 'email', 'created\_date')**

**task1/views.py:**

**from rest\_framework import viewsets**

**from rest\_framework import permissions**

**class PersonViewSet(viewsets.ModelViewSet):**

**"""**

**API endpoint that allows persons to be viewed.**

**"""**

**serializer\_class = PersonSerializer**

**queryset = Person.objects.order\_by('-created\_date')**

### Task 3: StringInverter

Your task is to provide a suite of tests for an invert function, using Pytest framework, covering all the requirements below.

#### Description of the invert function

invert function accepts a string and returns a string.

* When the string is empty it returns empty string.
* When the argument passed to the method is None it returns an empty string
* When the string has exactly one character the same string is returned
* When the string is longer then 1 character its inverted version is returned.

#### Examples of invert function usage

from inverter import invert

invert("a"); // returns "a"

invert(None); // returns ""

invert("abcd"); // return "dcba"

#### Requirements

* Your task is to implement a suite of tests in Pytest that will test all the possible behaviors of the invert function, as described above.
* Your suite of tests will be run against multiple (wrong and correct) implementations of invert function.
* All tests must pass for correct implementation. Otherwise you will receive 0%, so make sure that all tests pass for the correct one before submitting the task.
* For a wrong implementation of the invert function, at least one of the test cases should fail.
* Tests should be written using Python 3.8 and Pytest 5.3.5.

**task1/views.py:**

**def invert(s):**

**"""Accepts a string and returns a string"""**

**if isinstance(s, str) or s is None:**

**if s is None or len(s) == 0:**

**return ''**

**elif len(s) == 1:**

**return s**

**else:**

**return s[::-1]**

**else:**

**return 'Your input is not a string type!'**

**from inverter import invert**

**def test\_invert():**

**assert invert('ameer') == 'reema'**

**assert invert(None) == ''**

**assert invert('') == ''**

**assert invert(' ') == ' '**

**assert invert('h') == 'h'**

**assert invert(5) == 'Your input is not a string type!'**

**assert invert(['1','2','3']) == 'Your input is not a string type!'**

### Task 4: McqDocker1

A set of questions that checks basic Docker knowledge.

1.Select a Docker file command required to execute a build: B

A) MAINTAINER

B) FROM

C) ARG

D) FROM   
but only when using Docker multistage

2.The command for listing all containers in Docker is: A

A) docker container ls -a

B) docker ls --all

C) docker show --all

D) docker ps -aux

3.How to connect from one container to another within the same Docker network? D

A) You can use Docker API to ask the hosting system for IPs of the other containers in order to reach them via both UDP and TCP

B) You can use container's name to reach it via TCP

C) You can use container's name to reach it via UDP

D) You can use container's name to reach it via TCP or UDP

4.The command for transferring files from a host to a Docker container is: A

A) docker cp foo.txt mycontainer:/foo.txt

B) docker mv foo.txt mycontainer:/foo.txt

C) rsync foo.txt mycontainer:/foo.txt

D) docker sync -R foo.txt mycontainer:/foo.txt

5. What is the purpose of using EXPOSE command in Dockerfile? C

A) Exposing an image on another machine

B) Exposing volumes from one container to another

C) Exposing a specified port on which application is listening in the runtime

D) Exposing an image for specified user groups

6. What is a Docker hub? B

A) It's a service for connecting multiple containers before deployment

B) It's a registry service which allows users to download, share and manage Docker images

C) It's a tool for managing volumes among containers

D) It's a registry of all built and deployed images

7.How to start a terminal session of an already running container? D

A) It's impossible to enter a running container if it wasn't started in the interactive mode (-it).

B) docker container exec <container\_id> /bin/bash

C) docker run -it <container\_id> /bin/bash

D) docker exec -it <container\_id> /bin/bash

8. How to disable a specific container? Choose one wrong answer: A

A) docker stop <container\_id>

B) docker kill <container\_id>

C) docker rm <container\_id>

D) docker container pause <container\_id>

9.What is the correct way to pass an argument with a value during Docker build phase? A

A) Adding

--build-arg [KEY=VALUE,]

flag to the Docker build command.

B) Docker does not use any build arguments.

C) Setting it as an environment variable available on the machine executing a given build.

D) Defining it in .env file in the root directory.

10. What is the difference between EXPOSE and PUBLISH commands? C

A) When not specified neither

EXPOSE

nor -p, the service in the container will only be accessible from outside of the container itself.

B) If you

PUBLISH

a port, the service in the container is not accessible from outside Docker, but from within other Docker containers.

C) If you

EXPOSE

and -p a port, the service in the container is accessible from anywhere, even outside Docker.

D) When

EXPOSE

command is defined, ports can be accessible for the host

End of Challenge