پگاه گورکانی

ساختمان داده

تمرین پنجم

سکشن دوشنبه

دکتر اسکندری

```
import time

import random

import string

import matplotlib.pyplot as plt

def generate_random_names(size):

names = []

for _ in range(size):

first_name = ''.join(random.choices(string.ascii_uppercase, k=3))

last_name = ''.join(random.choices(string.ascii_uppercase, k=3))

names.append({'First Name': first_name, 'Last Name': last_name})

return names

def count_unique_names(names):

first_names = set()

last_names = set()

for name in names:

first_names.add(name['First Name'])

last_names.add(name['Last Name'])

return len(first_names), len(last_names)

sizes = [10, 100, 250, 500, 750, 1000]

execution_times = []

for size in sizes:

random_names = generate_random_names(size)
```

```
start_time = time.time()

unique_first_names, unique_last_names =

count_unique_names(random_names)

end_time = time.time()

print(f"Data Size: {size}, Unique First Names: {unique_first_names},

Unique Last Names: {unique_last_names}, Execution Time: {end_time -

start_time} seconds")

execution_times.append(end_time - start_time)

plt.plot(sizes, execution_times)

plt.xlabel('Data Size')

plt.ylabel('Execution Time')

plt.title('Execution Time for Different Data Sizes')

plt.show()
```