

Database Project (SWE3033) (Fall 2024)

Homework #5 (50pts, Due date: 11/5)

Student ID: _____2018310773_____

Student Name: _____임승재_____

Instruction: In this homework, we provide a dataset(airbnb-listings-newyork.json), and a jupyter notebook file(DBP_Homework5.ipynb). You should follow the instructions in these documents carefully.

Submit two files as follows:

- DBP_Homework5_StudentID.zip
- DBP_Homework5_StudentI.ipynb
- DBP_Homework5_StudentID.pdf

Important: When submitting, you must delete your **CONNECTION_STRING**.

- Your *Username* and *Password* information are here.
- Be sure to remove this before submitting.

Dataset description:

key	Type	description
id	Int	Airbnb's unique identifier for the listing
name	String	Name of the listing
property type	String	Property type of the listing
room type	Int	Room type of the listing
accommodates	Float	The maximum number of people a listing can accommodate
beds	Int	Number of beds
amenities	List	Amenities included in a listing
price	Float	Price per night
text	String	Description about listing

1. [10pts] Capture the code and results.

- Create a database and a collection. Specify the name of the database as 'airbnb'.

[Answer]

Enter your code and result here. You must show your result (captured image).

```
print(my_client)
print(database)
print(collection)
```

```
MongoClient(host=['seungjaerin-shard-00-02.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-01.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-00.d7a0.mongodb.net:27017'], document_class=dict, tz_aware=False, connect=True)
Database(MongoClient(host=['seungjaerin-shard-00-02.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-01.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-00.d7a0.mongodb.net:27017'], document_class=dict, tz_aware=False)['collection']
Database(MongoClient(host=['seungjaerin-shard-00-02.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-01.d7a0.mongodb.net:27017', 'seungjaerin-shard-00-00.d7a0.mongodb.net:27017'], document_class=dict, tz_aware=False)['collection']
```

[Answer]

```
collection.drop()

doc_list = []
for line in open('airbnb-listings-newyork.json', 'r'):
    doc_list.append(json.loads(line))
```

```
try:
    collection.insert_many(doc_list)
except pymongo.errors.BulkWriteError:
    pass
```

```
print("# documents:",len(doc_list))
print("Sample:\n", doc_list[0])
```

```
# documents: 1000
Sample:
{'id': 11627443, 'name': 'Upper East Side cozy private room', 'property type': 'Apartment', 'room type': 'Private room', 'accommodates': 2, 'beds': 1.0, 'amenities': ['Internet', 'Wireless Internet', 'Air condi
```

b. Apply a 20% discount to a listing price with a room type of **'Shared room,'** and then retrieve the top 5 listings with a room type of **'Shared room,'** sorted in descending order.

[Answer]

a) The number of listings	b) Top 5 listing price
295	160, 120, 100, 100, 80

Enter your code and result here. You must show your result (captured image).

```

a)
# ===== EDIT HERE =====

num_listings = collection.count_documents({'beds': {'$gte': 2}})

# =====

print(num_listings)

295

b)
# ===== EDIT HERE =====

sorted_shared_room_docs = collection.find({'room_type': 'Shared room'}, {'_id': 1, 'price': 1}).sort('price',
pymongo.DESCENDING)
top5_listings = list(sorted_shared_room_docs)[:5]

for listing in top5_listings:
    listing['price'] *= 0.8

# =====

print(*top5_listings, sep='\n')

{'_id': 7981341, 'price': 160.0}
{'_id': 8064530, 'price': 120.0}
{'_id': 11575453, 'price': 100.0}
{'_id': 1906596, 'price': 100.0}
{'_id': 16913861, 'price': 80.0}

```

3. [20pts] Fill in the blank and capture the code and results for the following questions.
- Update the value of ‘amenities’ to [‘Internet’, ‘Shampoo’] for documents in the collection whose ‘property_type’ is ‘Loft’.
 - Add the element ‘Heating’ to the list of ‘amenities’ for the documents in the collection whose ‘property_type’ is ‘Loft’.
 - Explain the operations used in ‘a’ and ‘b’ and describe their differences.

[Answer]

Fill in the table below. In the *init*, write the initial document before the update. For both *a)* and *b)*, write the document after the update.

init	<pre> {'_id': 7858169, 'amenities': ['Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Elevator in building', 'Buzzer/wireless intercom', 'Heating', 'Smoke detector', 'Carbon monoxide detector', 'Essentials']} {'_id': 13309763, 'amenities': ['TV', 'Cable TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Breakfast', 'Elevator in building', 'Buzzer/wireless intercom', 'Heating', 'Family/kid friendly', 'Washer', 'Dryer', 'Smoke detector', 'Carbon monoxide detector', 'First aid kit', 'Fire extinguisher', 'Essentials', 'Shampoo', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace']} {'_id': 15393322, 'amenities': ['TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Pets allowed', 'Elevator in building', 'Heating', 'Family/kid friendly', </pre>
------	---

	<p>'Washer', 'Dryer', 'Smoke detector', 'Essentials', 'Shampoo', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace']}]</p> <p>{'_id': 14857830, 'amenities': ['TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Elevator in building', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide detector', 'Essentials', 'Shampoo', 'Lock on bedroom door', 'Hangers', 'Hair dryer', 'Iron', 'translation missing: en.hosting_amenity_49', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 7648634, 'amenities': ['TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Heating', 'Smoke detector', 'Carbon monoxide detector', 'Fire extinguisher', 'Essentials', 'Shampoo', 'Hangers', 'Hair dryer', 'Iron', 'translation missing: en.hosting_amenity_49', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 15872852, 'amenities': ['TV', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Heating', 'Smoke detector', 'Carbon monoxide detector', 'Essentials', 'Lock on bedroom door', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace', 'translation missing: en.hosting_amenity_49', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 3530517, 'amenities': ['TV', 'Cable TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Breakfast', 'Buzzer/wireless intercom', 'Heating', 'Smoke detector', 'Carbon monoxide detector', 'First aid kit', 'Safety card', 'Fire extinguisher', 'Essentials', 'Shampoo', '24-hour check-in', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace', 'translation missing: en.hosting_amenity_49', 'translation missing: en.hosting_amenity_50', 'Self Check-In', 'Lockbox']}]</p> <p>{'_id': 16363434, 'amenities': ['TV', 'Cable TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Heating', 'Family/kid friendly', 'Washer', 'Dryer', 'Smoke detector', 'Carbon monoxide detector', 'Fire extinguisher', 'Essentials', 'Hangers', 'Iron']}]</p> <p>{'_id': 14824160, 'amenities': ['Wireless Internet', 'Air conditioning', 'Kitchen', 'Pets allowed', 'Heating', 'Family/kid friendly', 'Suitable for events', 'Smoke detector', 'Carbon monoxide detector', 'First aid kit', 'Safety card', 'Fire extinguisher', 'Essentials', 'Laptop friendly workspace', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 12088888, 'amenities': ['TV', 'Cable TV', 'Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Buzzer/wireless intercom', 'Heating', 'Family/kid friendly', 'Washer', 'Dryer', 'Smoke detector', 'Essentials', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace']}]</p> <p>{'_id': 1294438, 'amenities': ['Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Buzzer/wireless intercom', 'Heating', 'Suitable for events', 'Smoke detector', 'translation missing: en.hosting_amenity_49', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 13995614, 'amenities': ['TV', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Smoking allowed', 'Indoor fireplace', 'Family/kid friendly', 'Smoke detector', 'Carbon monoxide detector', 'Essentials', 'Shampoo', 'Hangers', 'Hair dryer', 'Laptop friendly workspace', 'translation missing: en.hosting_amenity_50']}]</p> <p>{'_id': 522081, 'amenities': ['Internet', 'Wireless Internet', 'Air conditioning', 'Kitchen', 'Pets live on this property', 'Dog(s)', 'Elevator in building', 'Hot tub', 'Buzzer/wireless intercom', 'Heating', 'Family/kid friendly', 'Washer', 'Dryer', 'Smoke detector', 'Carbon monoxide detector', 'First aid kit', 'Fire extinguisher', 'Essentials', 'Shampoo', 'Hangers', 'Hair dryer', 'Iron', 'Laptop friendly workspace', 'translation missing: en.hosting_amenity_50']}]</p>
--	---

a)	<pre>{'_id': 7858169, 'amenities': ['Internet', 'Shampoo']} {'_id': 13309763, 'amenities': ['Internet', 'Shampoo']} {'_id': 15393322, 'amenities': ['Internet', 'Shampoo']} {'_id': 14857830, 'amenities': ['Internet', 'Shampoo']} {'_id': 7648634, 'amenities': ['Internet', 'Shampoo']} {'_id': 15872852, 'amenities': ['Internet', 'Shampoo']} {'_id': 3530517, 'amenities': ['Internet', 'Shampoo']} {'_id': 16363434, 'amenities': ['Internet', 'Shampoo']} {'_id': 14824160, 'amenities': ['Internet', 'Shampoo']} {'_id': 12088888, 'amenities': ['Internet', 'Shampoo']} {'_id': 1294438, 'amenities': ['Internet', 'Shampoo']} {'_id': 13995614, 'amenities': ['Internet', 'Shampoo']} {'_id': 522081, 'amenities': ['Internet', 'Shampoo']}</pre>
b)	<pre>{'_id': 7858169, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 13309763, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 15393322, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 14857830, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 7648634, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 15872852, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 3530517, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 16363434, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 14824160, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 12088888, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 1294438, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 13995614, 'amenities': ['Internet', 'Shampoo', 'Heating']} {'_id': 522081, 'amenities': ['Internet', 'Shampoo', 'Heating']}</pre>
c)	<p><i>Explain the operations used in 'a' and 'b' and describe their differences.</i></p>

Enter your code and result here. You must show your result (captured image).

a)

===== EDIT HERE =====

```
collection.update_many(
    {'property_type': 'Loft'},
    {'$set': {'amenities': ['Internet', 'Shampoo']}}
)
```

=====

```
for listing in collection.find({'property_type': 'Loft'}, {'_id': 1, 'amenities': 1}):
    print(listing)
```

```
{'_id': 7858169, 'amenities': ['Internet', 'Shampoo']}
{'_id': 13309763, 'amenities': ['Internet', 'Shampoo']}
{'_id': 15393322, 'amenities': ['Internet', 'Shampoo']}
{'_id': 14857830, 'amenities': ['Internet', 'Shampoo']}
{'_id': 7648634, 'amenities': ['Internet', 'Shampoo']}
{'_id': 15872852, 'amenities': ['Internet', 'Shampoo']}
{'_id': 3530517, 'amenities': ['Internet', 'Shampoo']}
{'_id': 16363434, 'amenities': ['Internet', 'Shampoo']}
{'_id': 14824160, 'amenities': ['Internet', 'Shampoo']}
{'_id': 12088888, 'amenities': ['Internet', 'Shampoo']}
{'_id': 1294438, 'amenities': ['Internet', 'Shampoo']}
{'_id': 13995614, 'amenities': ['Internet', 'Shampoo']}
{'_id': 522081, 'amenities': ['Internet', 'Shampoo']}
```

b)

===== EDIT HERE =====

```
collection.update_many(
    {'property_type': 'Loft'},
    {'$push': {'amenities': 'Heating'}}
)
```

=====

```
for listing in collection.find({'property_type': 'Loft'}, {'_id': 1, 'amenities': 1}):
    print(listing)
```

```
{'_id': 7858169, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 13309763, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 15393322, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 14857830, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 7648634, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 15872852, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 3530517, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 16363434, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 14824160, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 12088888, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 1294438, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 13995614, 'amenities': ['Internet', 'Shampoo', 'Heating']}
{'_id': 522081, 'amenities': ['Internet', 'Shampoo', 'Heating']}
```

c)

a: The \$set operator is used to Add/Modify the key and its value. In this case, it sets the amenities field to exactly

['Internet', 'Shampoo'] for all collections whose 'property_type' is 'Loft'.

b: The \$push operator adds an element to a list-shaped value. In this case, it adds 'Heating' to the amenities field for all collections whose 'property_type' is 'Loft'..