

Dokumentowe bazy danych – MongoDB

ćwiczenie 2

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Yelp Dataset

- www.yelp.com - serwis społecznościowy – informacje o miejscach/lokalach
- restauracje, kluby, hotele itd. **businesses**,
- użytkownicy odwiedzają te miejsca - "meldują się" **check-in**
- użytkownicy piszą recenzje **reviews** o miejscach/lokalach i wystawiają oceny
- przykładowy zbiór danych zawiera dane z 5 miast: Phoenix, Las Vegas, Madison, Waterloo i Edinburgh.

Zadanie 1 - operacje wyszukiwania danych

Dla zbioru Yelp wykonaj następujące zapytania

W niektórych przypadkach może być potrzebne wykorzystanie mechanizmu Aggregation Pipeline

<https://www.mongodb.com/docs/manual/core/aggregation-pipeline/>

1. Zwróć dane wszystkich restauracji (kolekcja **business**, pole **categories** musi zawierać wartość "Restaurants"), które są otwarte w poniedziałki (pole **hours**) i mają ocenę co najmniej 4 gwiazdki (pole **stars**). Zapytanie powinno zwracać: nazwę firmy, adres, kategorię, godziny otwarcia i gwiazdki. Posortuj wynik wg nazwy firmy.
2. Ile każda firma otrzymała ocen/wskazówek (kolekcja **tip**) w 2012. Wynik powinien zawierać nazwę firmy oraz liczbę ocen/wskazówek. Wynik posortuj według liczby ocen (**tip**).
3. Recenzje mogą być oceniane przez innych użytkowników jako **cool**, **funny** lub **useful** (kolekcja **review**, pole **votes**, jedna recenzja może mieć kilka głosów w każdej kategorii). Napisz zapytanie, które zwraca dla każdej z tych kategorii, ile sumarycznie recenzji zostało oznaczonych przez te kategorie (np. recenzja ma kategorię **funny** jeśli co najmniej jedna osoba zagłosowała w ten sposób na daną recenzję)
4. Zwróć dane wszystkich użytkowników (kolekcja **user**), którzy nie mają ani jednego pozytywnego głosu (pole **votes**) z kategorii (**funny** lub **useful**), wynik posortuj alfabetycznie według nazwy użytkownika.
5. Wyznacz, jaką średnią ocenę uzyskała każda firma na podstawie wszystkich recenzji (kolekcja **review**, pole **stars**). Ogranicz do firm, które uzyskały średnią powyżej 3 gwiazdek.
 - a) Wynik powinien zawierać id firmy oraz średnią ocenę. Posortuj wynik wg id firmy.
 - b) Wynik powinien zawierać nazwę firmy oraz średnią ocenę. Posortuj wynik wg nazwy firmy.

Zadanie 1 - rozwiązanie

Wyniki:

przykłady, kod, zrzuty ekranów, komentarz ...

```
from pymongo import MongoClient
client = MongoClient('localhost', 27018)
db = client['yelp']

# Zadanie 1

pipeline_1 = [
    {"$match": {"categories": "Restaurants", "hours.Monday": {"$ne": "closed"},
    "stars": {"$gte": 4}}},
    {"$project": {"name": 1, "address": 1, "categories": 1, "hours": 1, "stars":
    1}},
    {"$sort": {"name": 1}}
]
result_1 = db.business.aggregate(pipeline_1)
list_1 = list(result_1)
for doc in list_1:
    print(doc)

# Zadanie 2

pipeline_2 = [
    {"$lookup": {"from": "business", "localField": "business_id", "foreignField":
    "business_id", "as": "business"}},
    {"$unwind": "$business"},
    {"$match": {"date": {"$regex": "^2012"}}},
    {"$group": {"_id": "$business_id", "count": {"$sum": 1}}},
    {"$project": {"name": "$business.name", "count": 1}},
    {"$sort": {"count": -1}}
]
result_2 = db.tip.aggregate(pipeline_2)
list_2 = list(result_2)
for doc in list_2:
    print(doc)

# Zadanie 3

pipeline_3 = [
    {"$group": {"_id": "$votes.cool", "count": {"$sum": 1}}},
    {"$project": {"category": "cool", "count": 1}},
    {"$unionWith": {"coll": "review", "pipeline": [
        {"$group": {"_id": "$votes.funny", "count": {"$sum": 1}}},
        {"$project": {"category": "funny", "count": 1}}
    ]}},
    {"$unionWith": {"coll": "review", "pipeline": [
        {"$group": {"_id": "$votes.useful", "count": {"$sum": 1}}},
```

```
        {"$project": {"category": "useful", "count": 1}}
    ]}},
    {"$group": {"_id": "$category", "count": {"$sum": 1}}}},
]
result_3 = db.review.aggregate(pipeline_3)
list_3=list(result_3)
for doc in list_3:
    print(doc)

# Zadanie 4
pipeline_4 = [
    {"$match": {"votes.funny": 0, "votes.useful": 0}},
    {"$project": {"name": 1}},
    {"$sort": {"name": 1}}
]
result_4 = db.user.aggregate(pipeline_4)
list_4 = list(result_4)
for doc in list_4:
    print(doc)

# Zadanie 5a
pipeline_5a = [
    {"$group": {"_id": "$business_id", "avg_stars": {"$avg": "$stars"}}},
    {"$match": {"avg_stars": {"$gt": 3}}},
    {"$project": {"avg_stars": 1}},
    {"$sort": {"name": 1}}
]
result_5a = db.review.aggregate(pipeline_5a)
list_5a = list(result_5a)
for doc in list_5a:
    print(doc)

# Zadanie 5b
print("Zadanie 5b")
pipeline_5b = [
    {"$group": {"_id": "$business_id", "avg_stars": {"$avg": "$stars"}}},
    {"$match": {"avg_stars": {"$gt": 3}}},
    {"$lookup": {"from": "business", "localField": "_id", "foreignField": "name",
"as": "business"}},
    {"$unwind": "$business"},
    {"$project": {"name": "$business.name", "avg_stars": 1}},
    {"$sort": {"name": 1}}
]
result_5b = db.review.aggregate(pipeline_5b)
list_5b = list(result_5b)
for doc in list_5b:
    print(doc)
```

Zadanie 2 - modelowanie danych

Zaproponuj strukturę bazy danych dla wybranego/przykładowego zagadnienia/problemu

Należy wybrać jedno zagadnienie/problem (A lub B)

Przykład A

- Wykładowcy, przedmioty, studenci, oceny
 - Wykładowcy prowadzą zajęcia z poszczególnych przedmiotów
 - Studenci uczęszczają na zajęcia
 - Wykładowcy wystawiają oceny studentom
 - Studenci oceniają zajęcia

Przykład B

- Firmy, wycieczki, osoby
 - Firmy organizują wycieczki
 - Osoby rezerwują miejsca/wykupują bilety
 - Osoby oceniają wycieczki

a) Warto zaproponować/rozważyć różne warianty struktury bazy danych i dokumentów w poszczególnych kolekcjach oraz przeprowadzić dyskusję każdego wariantu (wskazać wady i zalety każdego z wariantów)

b) Kolekcje należy wypełnić przykładowymi danymi

c) W kontekście zaprezentowania wad/zalet należy zaprezentować kilka przykładów/zapytań/zadań/operacji oraz dla których dedykowany jest dany wariant

W sprawozdaniu należy zamieścić przykładowe dokumenty w formacie JSON (pkt a) i b)), oraz kod zapytań/operacji (pkt c)), wraz z odpowiednim komentarzem opisującym strukturę dokumentów oraz polecenia ilustrujące wykonanie przykładowych operacji na danych

Do sprawozdania należy kompletny zrzut wykonanych/przygotowanych baz danych (taki zrzut można wykonać np. za pomocą poleceń `mongoexport`, `mongodump` ...) oraz plik z kodem operacji zapytań (załącznik powinien mieć format zip).

Zadanie 2 - rozwiązanie

Wyniki:

przykłady, kod, zrzuty ekranów, komentarz ...

Wariant Pierwszy. Wszystko jako oddzielny element

Model:

```
{
  "id": ObjectID(),
  "type": "company" | "client" | "review" | "trip",
  "details": {...},
}
```

Baza:

```
[
  {
    "_id": "60df26e8a2c4e82f644c016a",
    "type": "company",
    "name": "Adventure Tours Inc.",
    "details": {
      "address": "Los Angeles",
      "contact": "contact@adventuretours.com"
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c016b",
    "type": "trip",
    "name": "Grand Canyon Adventure",
    "details": {
      "organizer": "60df26e8a2c4e82f644c016a",
      "date": "2024-07-15",
      "duration": "5 days",
      "price": 1500,
      "max_capacity": 20
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c016c",
    "type": "client",
    "name": "John Doe",
    "details": {
      "email": "john.doe@example.com",
      "phone": "123-456-7890",
      "Trips": [
        {
          "id": "60df26e8a2c4e82f644c016b"
        },
        {
          "id": "60df26e8a2c4e82f644c0189"
        }
      ]
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c016d",
    "type": "review",
    "name": "Great trip!",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c016b",
      "person_id": "60df26e8a2c4e82f644c016c",
      "rating": 5,
      "comment": "Really enjoyed the experience."
    }
  }
],
```

```

{
  "_id": "60df26e8a2c4e82f644c016e",
  "type": "company",
  "name": "Wilderness Explorers",
  "details":{
    "address": "Denver",
    "contact": "info@wildernessexplorers.com"
  }
},
{
  "_id": "60df26e8a2c4e82f644c0174",
  "type": "company",
  "name": "Tropical Adventures Ltd.",
  "details":{
    "address": "Miami",
    "contact": "hello@tropicaladventures.com"
  }
},
{
  "_id": "60df26e8a2c4e82f644c0178",
  "type": "company",
  "name": "Alpine Adventures",
  "details":{
    "address": "Seattle",
    "contact": "info@alpineadventures.com"
  }
},
{
  "_id": "60df26e8a2c4e82f644c0180",
  "type": "company",
  "name": "Northern Lights Expeditions",
  "details":{
    "address": "Reykjavik",
    "contact": "info@northernlights.com"
  }
},
{
  "_id": "60df26e8a2c4e82f644c0184",
  "type": "company",
  "name": "Amazon Expeditions",
  "details":{
    "address": "Manaus",
    "contact": "contact@amazonexpeditions.com"
  }
},
{
  "_id": "60df26e8a2c4e82f644c016f",
  "type": "trip",
  "name": "Rocky Mountain Backpacking",
  "details":{
    "organizer": "60df26e8a2c4e82f644c016e",
    "date": "2024-06-20",
    "duration": "7 days",
    "price": 2000,

```

```
        "max_capacity": 15
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c0175",
      "type": "trip",
      "name": "Caribbean Cruise",
      "organizer": "60df26e8a2c4e82f644c0174",
      "details": {
        "date": "2024-08-10",
        "duration": "10 days",
        "price": 3000,
        "max_capacity": 30
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c0179",
      "type": "trip",
      "name": "Skiing in the Alps",
      "details": {
        "organizer": "60df26e8a2c4e82f644c0178",
        "date": "2024-12-01",
        "duration": "7 days",
        "price": 2500,
        "max_capacity": 12
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c017d",
      "type": "trip",
      "name": "Maasai Mara Safari",
      "details": {
        "organizer": "60df26e8a2c4e82f644c016e",
        "date": "2024-09-20",
        "duration": "4 days",
        "price": 1800,
        "max_capacity": 10
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c0181",
      "type": "trip",
      "name": "Icelandic Aurora Tour",
      "details": {
        "organizer": "60df26e8a2c4e82f644c0180",
        "date": "2024-11-10",
        "duration": "6 days",
        "price": 2800,
        "max_capacity": 15
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c0185",
      "type": "trip",
```

```

    "name": "Jungle Adventure",
    "organizer": "60df26e8a2c4e82f644c0184",
    "date": "2024-10-05",
    "details": {
      "duration": "8 days",
      "price": 2200,
      "max_capacity": 20
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0190",
    "type": "client",
    "name": "Olivia White",
    "details": {
      "email": "olivia.white@example.com",
      "phone": "123-456-7890",
      "Trips": [
        {
          "id": "60df26e8a2c4e82f644c016b"
        },
        {
          "id": "60df26e8a2c4e82f644c0179"
        },
        {
          "id": "60df26e8a2c4e82f644c0185"
        }
      ]
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0176",
    "type": "client",
    "name": "Emily Davis",
    "details": {
      "email": "emily.davis@example.com",
      "phone": "321-654-0987",
      "Trips": [
        {
          "id": "60df26e8a2c4e82f644c0175"
        }
      ]
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0192",
    "type": "client",
    "name": "Ethan Harris",
    "details": {
      "email": "ethan.harris@example.com",
      "phone": "901-234-5678",
      "Trips": [
        {
          "id": "60df26e8a2c4e82f644c016b"
        },

```



```

        {
            "id": "60df26e8a2c4e82f644c0179"
        },
        {
            "id": "60df26e8a2c4e82f644c0185"
        }
    ]
}
},
{
    "_id": "60df26e8a2c4e82f644c0170",
    "type": "client",
    "name": "Jane Smith",
    "details": {
        "email": "jane.smith@example.com",
        "phone": "987-654-3210",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c016f"
            }
        ]
    }
},
{
    "_id": "60df26e8a2c4e82f644c0172",
    "type": "client",
    "name": "Michael Johnson",
    "details": {
        "email": "michael.johnson@example.com",
        "phone": "456-789-0123",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c016f"
            },
            {
                "id": "60df26e8a2c4e82f644c0175"
            }
        ]
    }
},
{
    "_id": "60df26e8a2c4e82f644c0186",
    "type": "client",
    "name": "Sarah Taylor",
    "details": {
        "email": "sarah.taylor@example.com",
        "phone": "345-678-9012",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c016f"
            },
            {
                "id": "60df26e8a2c4e82f644c0179"
            }
        ]
    }
},

```

```

        {
            "id": "60df26e8a2c4e82f644c0185"
        }
    ]
},
{
    "_id": "60df26e8a2c4e82f644c017e",
    "type": "client",
    "name": "Jessica Brown",
    "details": {
        "email": "jessica.brown@example.com",
        "phone": "234-567-8901",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c017d"
            }
        ]
    }
},
{
    "_id": "60df26e8a2c4e82f644c0188",
    "type": "client",
    "name": "Alicia Martinez",
    "details": {
        "email": "alicia.martinez@example.com",
        "phone": "789-012-3456",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c017d"
            },
            {
                "id": "60df26e8a2c4e82f644c0185"
            }
        ]
    }
},
{
    "_id": "60df26e8a2c4e82f644c018a",
    "type": "client",
    "name": "Daniel Thompson",
    "details": {
        "email": "daniel.thompson@example.com",
        "phone": "234-567-8901",
        "Trips": [
            {
                "id": "60df26e8a2c4e82f644c017d"
            },
            {
                "id": "60df26e8a2c4e82f644c0185"
            }
        ]
    }
},

```

```

{
  "_id": "60df26e8a2c4e82f644c018c",
  "type": "client",
  "name": "Sophie Garcia",
  "details": {
    "email": "sophie.garcia@example.com",
    "phone": "567-890-1234",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  }
},
{
  "_id": "60df26e8a2c4e82f644c018e",
  "type": "client",
  "name": "Matthew Lee",
  "details": {
    "email": "matthew.lee@example.com",
    "phone": "345-678-9012",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  }
},
{
  "_id": "60df26e8a2c4e82f644c016z",
  "type": "rating",
  "name": "Rocky Mountain Backpacking Review",
  "details": {
    "trip_id": "60df26e8a2c4e82f644c016f",
    "person_id": "60df26e8a2c4e82f644c0170",
    "rating": 4,
    "comment": "Beautiful scenery, knowledgeable guides."
  }
},
{
  "_id": "60df26e8a2c4e82f644c0171",
  "type": "rating",
  "name": "Rocky Mountain Backpacking Review",
  "details": {
    "trip_id": "60df26e8a2c4e82f644c016f",
    "person_id": "60df26e8a2c4e82f644c0172",
    "rating": 5,
    "comment": "An unforgettable experience!"
  }
}

```

```

    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0193",
    "type": "rating",
    "name": "Grand Canyon Adventure Review",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c016b",
      "person_id": "60df26e8a2c4e82f644c0190",
      "rating": 5,
      "comment": "An amazing journey, will cherish the memories forever!"
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0191",
    "type": "rating",
    "name": "Grand Canyon Adventure Review",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c016b",
      "person_id": "60df26e8a2c4e82f644c0192",
      "rating": 4,
      "comment": "Great trip, would recommend to others."
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0177",
    "type": "rating",
    "name": "Caribbean Cruise Review",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c0175",
      "person_id": "60df26e8a2c4e82f644c0176",
      "rating": 5,
      "comment": "Absolutely amazing trip!"
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c0173",
    "type": "rating",
    "name": "Caribbean Cruise Review",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c0175",
      "person_id": "60df26e8a2c4e82f644c0172",
      "rating": 5,
      "comment": "An unforgettable experience!"
    }
  },
  {
    "_id": "60df26e8a2c4e82f644c017f",
    "type": "rating",
    "name": "Maasai Mara Safari Review",
    "details": {
      "trip_id": "60df26e8a2c4e82f644c017d",
      "person_id": "60df26e8a2c4e82f644c017e",
      "rating": 5,

```

```
      "comment": "Witnessed incredible wildlife!"
    },
    {
      "_id": "60df26e8a2c4e82f644c0189",
      "type": "rating",
      "name": "Maasai Mara Safari Review",
      "details": {
        "trip_id": "60df26e8a2c4e82f644c017d",
        "person_id": "60df26e8a2c4e82f644c0188",
        "rating": 5,
        "comment": "Unforgettable experience, highly recommended!"
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c018b",
      "type": "rating",
      "name": "Maasai Mara Safari Review",
      "details": {
        "trip_id": "60df26e8a2c4e82f644c017d",
        "person_id": "60df26e8a2c4e82f644c018a",
        "rating": 4,
        "comment": "Amazing trip, great guides!"
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c018d",
      "type": "rating",
      "name": "Maasai Mara Safari Review",
      "details": {
        "trip_id": "60df26e8a2c4e82f644c017d",
        "person_id": "60df26e8a2c4e82f644c018c",
        "rating": 5,
        "comment": "Incredible adventure, exceeded expectations!"
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c018f",
      "type": "rating",
      "name": "Maasai Mara Safari Review",
      "details": {
        "trip_id": "60df26e8a2c4e82f644c017d",
        "person_id": "60df26e8a2c4e82f644c018e",
        "rating": 4,
        "comment": "Beautiful landscapes, friendly staff."
      }
    },
    {
      "_id": "60df26e8a2c4e82f644c0183",
      "type": "rating",
      "name": "Icelandic Aurora Tour Review",
      "details": {
        "trip_id": "60df26e8a2c4e82f644c0181",
        "person_id": "60df26e8a2c4e82f644c0182",
```

```

        "rating": 5,
        "comment": "Breathtaking views of the aurora borealis!"
    },
    {
        "id": "60df26e8a2c4e82f644c0189",
        "type": "trip",
        "name": "Szkołna 17 Trip",
        "details": {
            "organizer": "60df26e8a2c4e82f644c0180",
            "date": "2025-12-05",
            "duration": "10 days",
            "price": 3500,
            "max_capacity": 20
        }
    },
    {
        "_id": "60df26e8a2c4e82f644c017a",
        "type": "client",
        "name": "Chris Williams",
        "details": {
            "email": "chris.williams@example.com",
            "phone": "789-012-3456",
            "Trips": [
                {
                    "id": "60df26e8a2c4e82f644c0179"
                }
            ]
        }
    },
    {
        "_id": "60df26e8a2c4e82f644c0182",
        "type": "client",
        "name": "David Wilson",
        "details": {
            "email": "david.wilson@example.com",
            "phone": "567-890-1234",
            "Trips": [
                {
                    "id": "60df26e8a2c4e82f644c0181"
                }
            ]
        }
    }
]

```

Zapytania i operacje:

```

from pymongo import MongoClient

# Połączenie z bazą danych MongoDB

```

```

port = "mongodb://localhost:27018/"
db_name = "OwnMongoBase1"
collection_name = "OneToRuleThemAll"
client = MongoClient(port)
db = client[db_name]
collection = db[collection_name]

# Wszystkie firmy
# W tym wariancie jest to bardzo proste (jak w każdym)
all_companies = collection.find({"type": "company"})
for company in all_companies:
    print(company)

# Klienci, którzy uczestniczyli w wycieczkach zorganizowanych przez "Northern
Lights Expeditions"
# W tym wariancie wymaga użycia list comprehension oraz kilku zmiennych co
przynajmniej naszym zdaniem nie jest zbyt czytelne
northern_lights_company = collection.find_one({"type": "company", "name":
"Northern Lights Expeditions"})
northern_lights_company_id = northern_lights_company["_id"]
northern_lights_customers = collection.find({
    "type": "client",
    "details.Trips.id": {"$in": [trip["_id"] for trip in collection.find({"type":
"trip", "details.organizer": northern_lights_company_id})]}
}))
for customer in northern_lights_customers:
    print(customer)

# Wycieczki z Johnem Doe jako uczestnikiem
# Kolejny raz List Comprehension i zmienne
john_doe_trips = collection.find_one({"type": "client", "name": "John Doe"})
['details']['Trips']
john_doe_trip_ids = [trip['id'] for trip in john_doe_trips]
john_doe_trips = collection.find({"type": "trip", "_id": {"$in":
john_doe_trip_ids}})
# for trip in john_doe_trips:
#     print(trip)

# Średnia ocena wszystkich wycieczek
# To query natomiast jest już bardziej czytelne
average_rating_cursor = collection.aggregate([
    {"$match": {"type": "rating"}},
    {"$group": {"_id": None, "avg_rating": {"$avg": "$details.rating"}}}
])
average_rating = list(average_rating_cursor)[0]['avg_rating']
print("Średnia ocena wszystkich wycieczek:", average_rating)

```

Wariant Drugi. Wszystko podzielone na 5 plików

clients.json

Model:

```
{
  "_id": ObjectID(),
  "name": "...",
  "email": "...",
  "phone": "...",
  "Trips": [
    {
      "id": "..."
    }
  ]
}
```

Baza:

```
[
  {
    "_id": "60df26e8a2c4e82f644c016c",
    "name": "John Doe",
    "email": "john.doe@example.com",
    "phone": "123-456-7890",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016b"
      },
      {
        "id": "60df26e8a2c4e82f644c0189"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c0190",
    "name": "Olivia White",
    "email": "olivia.white@example.com",
    "phone": "123-456-7890",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016b"
      },
      {
        "id": "60df26e8a2c4e82f644c0179"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  },
  {

```



```

    "_id": "60df26e8a2c4e82f644c0192",
    "name": "Ethan Harris",
    "email": "ethan.harris@example.com",
    "phone": "901-234-5678",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016b"
      },
      {
        "id": "60df26e8a2c4e82f644c0179"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c0170",
    "name": "Jane Smith",
    "email": "jane.smith@example.com",
    "phone": "987-654-3210",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016f"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c0172",
    "name": "Michael Johnson",
    "email": "michael.johnson@example.com",
    "phone": "456-789-0123",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016f"
      },
      {
        "id": "60df26e8a2c4e82f644c0175"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c0186",
    "name": "Sarah Taylor",
    "email": "sarah.taylor@example.com",
    "phone": "345-678-9012",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c016f"
      },
      {
        "id": "60df26e8a2c4e82f644c0179"
      }
    ]
  }

```

```

        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c017e",
    "name": "Jessica Brown",
    "email": "jessica.brown@example.com",
    "phone": "234-567-8901",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c0188",
    "name": "Alicia Martinez",
    "email": "alicia.martinez@example.com",
    "phone": "789-012-3456",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c018a",
    "name": "Daniel Thompson",
    "email": "daniel.thompson@example.com",
    "phone": "234-567-8901",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  },
  {
    "_id": "60df26e8a2c4e82f644c018c",
    "name": "Sophie Garcia",
    "email": "sophie.garcia@example.com",
    "phone": "567-890-1234",
    "Trips": [
      {
        "id": "60df26e8a2c4e82f644c017d"
      },
      {
        "id": "60df26e8a2c4e82f644c0185"
      }
    ]
  }
]

```

```
    }
  ]
},
{
  "_id": "60df26e8a2c4e82f644c018e",
  "name": "Matthew Lee",
  "email": "matthew.lee@example.com",
  "phone": "345-678-9012",
  "Trips": [
    {
      "id": "60df26e8a2c4e82f644c017d"
    },
    {
      "id": "60df26e8a2c4e82f644c0185"
    }
  ]
},
{
  "_id": "60df26e8a2c4e82f644c0176",
  "name": "Emily Davis",
  "email": "emily.davis@example.com",
  "phone": "321-654-0987",
  "Trips": [
    {
      "id": "60df26e8a2c4e82f644c0175"
    }
  ]
},
{
  "_id": "60df26e8a2c4e82f644c017a",
  "name": "Chris Williams",
  "email": "chris.williams@example.com",
  "phone": "789-012-3456",
  "Trips": [
    {
      "id": "60df26e8a2c4e82f644c0179"
    }
  ]
},
{
  "_id": "60df26e8a2c4e82f644c0182",
  "name": "David Wilson",
  "email": "david.wilson@example.com",
  "phone": "567-890-1234",
  "Trips": [
    {
      "id": "60df26e8a2c4e82f644c0181"
    }
  ]
}
]
```

companies.json**Model:**

```
{
  "_id": ObjectID(),
  "name": "...",
  "address": "...",
  "contact": "..."
}
```

Baza:

```
[
  {
    "_id": "60df26e8a2c4e82f644c016a",
    "name": "Adventure Tours Inc.",
    "address": "Los Angeles",
    "contact": "contact@adventuretours.com"
  },
  {
    "_id": "60df26e8a2c4e82f644c016e",
    "name": "Wilderness Explorers",
    "address": "Denver",
    "contact": "info@wildernessexplorers.com"
  },
  {
    "_id": "60df26e8a2c4e82f644c0174",
    "name": "Tropical Adventures Ltd.",
    "address": "Miami",
    "contact": "hello@tropicaladventures.com"
  },
  {
    "_id": "60df26e8a2c4e82f644c0178",
    "name": "Alpine Adventures",
    "address": "Seattle",
    "contact": "info@alpineadventures.com"
  },
  {
    "_id": "60df26e8a2c4e82f644c0180",
    "name": "Northern Lights Expeditions",
    "address": "Reykjavik",
    "contact": "info@northernlights.com"
  },
  {
    "_id": "60df26e8a2c4e82f644c0184",
    "name": "Amazon Expeditions",
    "address": "Manaus",
    "contact": "contact@amazonexpeditions.com"
  }
]
```

```
}  
]
```

reviews.json

Model:

```
{  
  "_id": ObjectID(),  
  "name": "...",  
  "trip_id": "...",  
  "person_id": "...",  
  "rating": ,  
  "comment": "..."  
},
```

Baza:

```
[  
  {  
    "_id": "60df26e8a2c4e82f644c016d",  
    "name": "Great trip!",  
    "trip_id": "60df26e8a2c4e82f644c016b",  
    "person_id": "60df26e8a2c4e82f644c016c",  
    "rating": 5,  
    "comment": "Really enjoyed the experience."  
  },  
  {  
    "_id": "60df26e8a2c4e82f644c016f",  
    "name": "Rocky Mountain Backpacking Review",  
    "trip_id": "60df26e8a2c4e82f644c016f",  
    "person_id": "60df26e8a2c4e82f644c0170",  
    "rating": 4,  
    "comment": "Beautiful scenery, knowledgeable guides."  
  },  
  {  
    "_id": "60df26e8a2c4e82f644c0171",  
    "name": "Rocky Mountain Backpacking Review",  
    "trip_id": "60df26e8a2c4e82f644c016f",  
    "person_id": "60df26e8a2c4e82f644c0172",  
    "rating": 5,  
    "comment": "An unforgettable experience!"  
  },  
  {  
    "_id": "60df26e8a2c4e82f644c0193",  
    "name": "Grand Canyon Adventure Review",  
    "trip_id": "60df26e8a2c4e82f644c016b",  
    "person_id": "60df26e8a2c4e82f644c0192",
```

```
    "rating": 4,
    "comment": "Great experience, would love to do it again!"
  },
  {
    "_id": "60df26e8a2c4e82f644c0191",
    "name": "Grand Canyon Adventure Review",
    "trip_id": "60df26e8a2c4e82f644c016b",
    "person_id": "60df26e8a2c4e82f644c0190",
    "rating": 5,
    "comment": "An amazing journey, will cherish the memories forever!"
  },
  {
    "_id": "60df26e8a2c4e82f644c0177",
    "name": "Caribbean Cruise Review",
    "trip_id": "60df26e8a2c4e82f644c0175",
    "person_id": "60df26e8a2c4e82f644c0176",
    "rating": 5,
    "comment": "Absolutely amazing trip!"
  },
  {
    "_id": "60df26e8a2c4e82f644c0173",
    "name": "Caribbean Cruise Review",
    "trip_id": "60df26e8a2c4e82f644c0175",
    "person_id": "60df26e8a2c4e82f644c0172",
    "rating": 5,
    "comment": "An unforgettable experience!"
  },
  {
    "_id": "60df26e8a2c4e82f644c017f",
    "name": "Maasai Mara Safari Review",
    "trip_id": "60df26e8a2c4e82f644c017d",
    "person_id": "60df26e8a2c4e82f644c017e",
    "rating": 5,
    "comment": "Witnessed incredible wildlife!"
  },
  {
    "_id": "60df26e8a2c4e82f644c0189",
    "name": "Maasai Mara Safari Review",
    "trip_id": "60df26e8a2c4e82f644c017d",
    "person_id": "60df26e8a2c4e82f644c0188",
    "rating": 5,
    "comment": "Unforgettable experience, highly recommended!"
  },
  {
    "_id": "60df26e8a2c4e82f644c018b",
    "name": "Maasai Mara Safari Review",
    "trip_id": "60df26e8a2c4e82f644c017d",
    "person_id": "60df26e8a2c4e82f644c018a",
    "rating": 4,
    "comment": "Amazing trip, great guides!"
  },
  {
    "_id": "60df26e8a2c4e82f644c018d",
    "name": "Maasai Mara Safari Review",
```

```

    "trip_id": "60df26e8a2c4e82f644c017d",
    "person_id": "60df26e8a2c4e82f644c018c",
    "rating": 5,
    "comment": "Incredible adventure, exceeded expectations!"
  },
  {
    "_id": "60df26e8a2c4e82f644c018f",
    "name": "Maasai Mara Safari Review",
    "trip_id": "60df26e8a2c4e82f644c017d",
    "person_id": "60df26e8a2c4e82f644c018e",
    "rating": 4,
    "comment": "Beautiful landscapes, friendly staff."
  },
  {
    "_id": "60df26e8a2c4e82f644c0183",
    "name": "Icelandic Aurora Tour Review",
    "trip_id": "60df26e8a2c4e82f644c0181",
    "person_id": "60df26e8a2c4e82f644c0182",
    "rating": 5,
    "comment": "Breathtaking views of the aurora borealis!"
  }
]

```

trips.json

Model:

```

{
  "_id": ObjectID(),
  "organizer": ObjectID(),
  "name": "...",
  "date": "...",
  "duration": "...",
  "price": ,
  "max_capacity":
},

```

Baza:

```

[
  {
    "_id": "60df26e8a2c4e82f644c016b",
    "organizer": "60df26e8a2c4e82f644c016a",
    "name": "Grand Canyon Adventure",
    "date": "2024-07-15",
    "duration": "5 days",
    "price": 1500,
    "max_capacity": 20
  }
]

```

```
    },
    {
      "_id": "60df26e8a2c4e82f644c016f",
      "organizer": "60df26e8a2c4e82f644c016e",
      "name": "Rocky Mountain Backpacking",
      "date": "2024-06-20",
      "duration": "7 days",
      "price": 2000,
      "max_capacity": 15
    },
    {
      "_id": "60df26e8a2c4e82f644c017d",
      "organizer": "60df26e8a2c4e82f644c016e",
      "name": "Maasai Mara Safari",
      "date": "2024-09-20",
      "duration": "4 days",
      "price": 1800,
      "max_capacity": 10
    },
    {
      "_id": "60df26e8a2c4e82f644c0175",
      "organizer": "60df26e8a2c4e82f644c0174",
      "name": "Caribbean Cruise",
      "date": "2024-08-10",
      "duration": "10 days",
      "price": 3000,
      "max_capacity": 30
    },
    {
      "_id": "60df26e8a2c4e82f644c0179",
      "organizer": "60df26e8a2c4e82f644c0178",
      "name": "Skiing in the Alps",
      "date": "2024-12-01",
      "duration": "7 days",
      "price": 2500,
      "max_capacity": 12
    },
    {
      "_id": "60df26e8a2c4e82f644c0181",
      "organizer": "60df26e8a2c4e82f644c0180",
      "name": "Icelandic Aurora Tour",
      "date": "2024-11-10",
      "duration": "6 days",
      "price": 2800,
      "max_capacity": 15
    },
    {
      "_id": "60df26e8a2c4e82f644c0189",
      "organizer": "60df26e8a2c4e82f644c0180",
      "name": "Szkolna 17 Trip",
      "date": "2025-12-05",
      "duration": "10 days",
      "price": 3500,
      "max_capacity": 20
    }
  ]
}
```



```
    },
    {
      "_id": "60df26e8a2c4e82f644c0185",
      "organizer": "60df26e8a2c4e82f644c0184",
      "name": "Jungle Adventure",
      "date": "2024-10-05",
      "duration": "8 days",
      "price": 2200,
      "max_capacity": 20
    }
  ]
}
```

Zapytania i operacje:

```
from pymongo import MongoClient

# Połączenie z bazą danych MongoDB

port = "mongodb://localhost:27018/"
db_name = "OwnMongoBase2"
client = MongoClient(port)
db = client[db_name]
# Wczytanie Kolekcji
companies_collection = db['companies']
clients_collection = db['clients']
trips_collection = db['trips']
reviews_collection = db['reviews']

# Wszystkie firmy
# Super proste Query
companies=companies_collection.find({})
for company in companies:
    print(company)

# Klienci, którzy uczestniczyli w wycieczkach zorganizowanych przez "Northern
Lights Expeditions"
# Wymaga użycia zmiennych ale dalej jest czytelne
clients=clients_collection.find({"Trips.organizer": "Northern Lights
Expeditions"})
for client in clients:
    print(client)

# Wycieczki z Johnem Doe jako uczestnikiem
# Wymaga użycia zmiennych ale ponownie jest czytelne
customer = clients_collection.find_one({"name": "John Doe"})
trips=trips_collection.find({"_id": {"$in": [trip['id'] for trip in
customer['Trips']]}})
for trip in trips:
    print(trip)
```

```
# Średnia ocena wszystkich wycieczek
reviews_collection = db['reviews']
all_ratings = [review['rating'] for review in reviews_collection.find({})]
rating= sum(all_ratings) / len(all_ratings)
print(rating)
```

Wariant Trzeci. Zagnieżdżone elementy

Model:

```
{
  "_id": ObjectID(),
  "company": {
    "_id": "...",
    "name": "...",
    "location": "...",
    "contact": "..."
  },
  "Trips": [
    {
      "details": {
        "_id": ObjectID(),
        "name": "...",
        "date": "...",
        "duration": "...",
        "price": ,
        "max_capacity":
      },
      "attendants": [
        {
          "client": {
            "_id": ObjectID(),
            "name": "...",
            "email": "...",
            "phone": "..."
          },
          "review": {
            "_id": ObjectID(),
            "rating": ,
            "comment": "..."
          }
        }
      ]
    }
  ]
},
```

Baza:

```
[
  {
    "_id": "5f8f4b3b9b1f3b0017f3b3b1",
    "company": {
      "_id": "60df26e8a2c4e82f644c016a",
      "name": "Adventure Tours Inc.",
      "location": "Los Angeles",
      "contact": "contact@adventuretours.com"
    },
    "Trips": [
      {
        "details": {
          "_id": "60df26e8a2c4e82f644c016b",
          "name": "Grand Canyon Adventure",
          "date": "2024-07-15",
          "duration": "5 days",
          "price": 1500,
          "max_capacity": 20
        },
        "attendants": [
          {
            "client": {
              "_id": "60df26e8a2c4e82f644c016c",
              "name": "John Doe",
              "email": "john.doe@example.com",
              "phone": "123-456-7890"
            },
            "review": {
              "_id": "60df26e8a2c4e82f644c016d",
              "rating": 5,
              "comment": "Really enjoyed the experience."
            }
          },
          {
            "client": {
              "_id": "60df26e8a2c4e82f644c0190",
              "name": "Olivia White",
              "email": "olivia.white@example.com",
              "phone": "123-456-7890"
            },
            "review": {
              "_id": "60df26e8a2c4e82f644c0191",
              "rating": 5,
              "comment": "An amazing journey, will cherish the
memories forever!"
            }
          }
        ]
      },
      {
        "client": {
          "_id": "60df26e8a2c4e82f644c0192",
          "name": "Ethan Harris",
          "email": "ethan.harris@example.com",
          "phone": "901-234-5678"
        }
      }
    ]
  }
]
```

```

        },
        "review": {
            "_id": "60df26e8a2c4e82f644c0193",
            "rating": 4,
            "comment": "Great experience, would love to do it
again!"
        }
    }
]
}
],
{
    "_id": "5f8f4b3b9b1f3b0017f3b3b2",
    "company": {
        "_id": "60df26e8a2c4e82f644c016e",
        "name": "Wilderness Explorers",
        "location": "Denver",
        "contact": "info@wildernessexplorers.com"
    },
    "Trips" : [
        {
            "details": {
                "_id": "60df26e8a2c4e82f644c016f",
                "name": "Rocky Mountain Backpacking",
                "date": "2024-06-20",
                "duration": "7 days",
                "price": 2000,
                "max_capacity": 15
            },
            "attendants": [
                {
                    "client": {
                        "_id": "60df26e8a2c4e82f644c0170",
                        "name": "Jane Smith",
                        "email": "jane.smith@example.com",
                        "phone": "987-654-3210"
                    },
                    "review": {
                        "_id": "60df26e8a2c4e82f644c0171",
                        "rating": 4,
                        "comment": "Beautiful scenery, knowledgeable guides."
                    }
                },
                {
                    "client": {
                        "_id": "60df26e8a2c4e82f644c0172",
                        "name": "Michael Johnson",
                        "email": "michael.johnson@example.com",
                        "phone": "456-789-0123"
                    },
                    "review": {
                        "_id": "60df26e8a2c4e82f644c0173",
                        "rating": 5,

```

```

        "comment": "An unforgettable experience!"
    },
    {
        "client": {
            "_id": "60df26e8a2c4e82f644c0186",
            "name": "Sarah Taylor",
            "email": "sarah.taylor@example.com",
            "phone": "345-678-9012"
        },
        "review": {
            "_id": "60df26e8a2c4e82f644c0187",
            "rating": 4,
            "comment": "Loved the diversity of wildlife!"
        }
    }
]
},
{
    "details": {
        "_id": "60df26e8a2c4e82f644c017d",
        "name": "Maasai Mara Safari",
        "date": "2024-09-20",
        "duration": "4 days",
        "price": 1800,
        "max_capacity": 10
    },
    "attendants": [
        {
            "client": {
                "_id": "60df26e8a2c4e82f644c017e",
                "name": "Jessica Brown",
                "email": "jessica.brown@example.com",
                "phone": "234-567-8901"
            },
            "review": {
                "_id": "60df26e8a2c4e82f644c017f",
                "rating": 5,
                "comment": "Witnessed incredible wildlife!"
            }
        },
        {
            "client": {
                "_id": "60df26e8a2c4e82f644c0188",
                "name": "Alicia Martinez",
                "email": "alicia.martinez@example.com",
                "phone": "789-012-3456"
            },
            "review": {
                "_id": "60df26e8a2c4e82f644c0189",
                "rating": 5,
                "comment": "Unforgettable experience, highly
recommended!"
            }
        }
    ]
}

```

```

    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c018a",
        "name": "Daniel Thompson",
        "email": "daniel.thompson@example.com",
        "phone": "234-567-8901"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c018b",
        "rating": 4,
        "comment": "Amazing trip, great guides!"
      }
    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c018c",
        "name": "Sophie Garcia",
        "email": "sophie.garcia@example.com",
        "phone": "567-890-1234"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c018d",
        "rating": 5,
        "comment": "Incredible adventure, exceeded
expectations!"
      }
    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c018e",
        "name": "Matthew Lee",
        "email": "matthew.lee@example.com",
        "phone": "345-678-9012"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c018f",
        "rating": 4,
        "comment": "Beautiful landscapes, friendly staff."
      }
    }
  ]
}

],
{
  "_id": "5f8f4b3b9b1f3b0017f3b3b3",
  "company": {
    "_id": "60df26e8a2c4e82f644c0174",
    "name": "Tropical Adventures Ltd.",
    "location": "Miami",
    "contact": "hello@tropicaladventures.com"
  },
  "Trips": [

```

```

    {
      "details": {
        "_id": "60df26e8a2c4e82f644c0175",
        "name": "Caribbean Cruise",
        "date": "2024-08-10",
        "duration": "10 days",
        "price": 3000,
        "max_capacity": 30
      },
      "attendants": [
        {
          "client": {
            "_id": "60df26e8a2c4e82f644c0176",
            "name": "Emily Davis",
            "email": "emily.davis@example.com",
            "phone": "321-654-0987"
          },
          "review": {
            "_id": "60df26e8a2c4e82f644c0177",
            "rating": 5,
            "comment": "Absolutely amazing trip!"
          }
        },
        {
          "client": {
            "_id": "60df26e8a2c4e82f644c0172",
            "name": "Michael Johnson",
            "email": "michael.johnson@example.com",
            "phone": "456-789-0123"
          },
          "review": {
            "_id": "60df26e8a2c4e82f644c0173",
            "rating": 5,
            "comment": "An unforgettable experience!"
          }
        }
      ]
    }
  ],
  {
    "_id": "5f8f4b3b9b1f3b0017f3b3b4",
    "company": {
      "_id": "60df26e8a2c4e82f644c0178",
      "name": "Alpine Adventures",
      "location": "Seattle",
      "contact": "info@alpineadventures.com"
    },
    "Trips": [
      {
        "details": {
          "_id": "60df26e8a2c4e82f644c0179",
          "name": "Skiing in the Alps",
          "date": "2024-12-01",

```

```

        "duration": "7 days",
        "price": 2500,
        "max_capacity": 12
    },
    "attendants": [
        {
            "client": {
                "_id": "60df26e8a2c4e82f644c017a",
                "name": "Chris Williams",
                "email": "chris.williams@example.com",
                "phone": "789-012-3456"
            },
            "review": {
                "_id": "60df26e8a2c4e82f644c017b",
                "rating": 4,
                "comment": "Great slopes and cozy accommodations!"
            }
        },
        {
            "client": {
                "_id": "60df26e8a2c4e82f644c0186",
                "name": "Sarah Taylor",
                "email": "sarah.taylor@example.com",
                "phone": "345-678-9012"
            },
            "review": {
                "_id": "60df26e8a2c4e82f644c0187",
                "rating": 4,
                "comment": "Loved the diversity of wildlife!"
            }
        }
    ],
    {
        "client": {
            "_id": "60df26e8a2c4e82f644c0190",
            "name": "Olivia White",
            "email": "olivia.white@example.com",
            "phone": "123-456-7890"
        },
        "review": {
            "_id": "60df26e8a2c4e82f644c0191",
            "rating": 5,
            "comment": "An amazing journey, will cherish the
memories forever!"
        }
    },
    {
        "client": {
            "_id": "60df26e8a2c4e82f644c0192",
            "name": "Ethan Harris",
            "email": "ethan.harris@example.com",
            "phone": "901-234-5678"
        },
        "review": {
            "_id": "60df26e8a2c4e82f644c0193",
            "rating": 4,

```



```

        "comment": "Great experience, would love to do it
again!"
    }
}
]
},
{
  "_id": "5f8f4b3b9b1f3b0017f3b3b6",
  "company": {
    "_id": "60df26e8a2c4e82f644c0180",
    "name": "Northern Lights Expeditions",
    "location": "Reykjavik",
    "contact": "info@northernlights.com"
  },
  "Trips": [
    {
      "details": {
        "_id": "60df26e8a2c4e82f644c0181",
        "name": "Icelandic Aurora Tour",
        "date": "2024-11-10",
        "duration": "6 days",
        "price": 2800,
        "max_capacity": 15
      },
      "attendants": [
        {
          "client": {
            "_id": "60df26e8a2c4e82f644c0182",
            "name": "David Wilson",
            "email": "david.wilson@example.com",
            "phone": "567-890-1234"
          },
          "review": {
            "_id": "60df26e8a2c4e82f644c0183",
            "rating": 5,
            "comment": "Breathtaking views of the aurora
borealis!"
          }
        }
      ]
    }
  ]
},
{
  "_id": "5f8f4b3b9b1f3b0017f3b3b7",
  "company": {
    "_id": "60df26e8a2c4e82f644c0184",
    "name": "Amazon Expeditions",
    "location": "Manaus",
    "contact": "contact@amazonexpeditions.com"
  },
  "Trips": [

```

```

{
  "details": {
    "_id": "60df26e8a2c4e82f644c0185",
    "name": "Jungle Adventure",
    "date": "2024-10-05",
    "duration": "8 days",
    "price": 2200,
    "max_capacity": 20
  },
  "attendants": [
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c0186",
        "name": "Sarah Taylor",
        "email": "sarah.taylor@example.com",
        "phone": "345-678-9012"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c0187",
        "rating": 4,
        "comment": "Loved the diversity of wildlife!"
      }
    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c0188",
        "name": "Alicia Martinez",
        "email": "alicia.martinez@example.com",
        "phone": "789-012-3456"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c0189",
        "rating": 5,
        "comment": "Unforgettable experience, highly
recommended!"
      }
    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c018a",
        "name": "Daniel Thompson",
        "email": "daniel.thompson@example.com",
        "phone": "234-567-8901"
      },
      "review": {
        "_id": "60df26e8a2c4e82f644c018b",
        "rating": 4,
        "comment": "Amazing trip, great guides!"
      }
    },
    {
      "client": {
        "_id": "60df26e8a2c4e82f644c018c",
        "name": "Sophie Garcia",

```

```

        "email": "sophie.garcia@example.com",
        "phone": "567-890-1234"
    },
    "review": {
        "_id": "60df26e8a2c4e82f644c018d",
        "rating": 5,
        "comment": "Incredible adventure, exceeded
expectations!"
    }
},
{
    "client": {
        "_id": "60df26e8a2c4e82f644c018e",
        "name": "Matthew Lee",
        "email": "matthew.lee@example.com",
        "phone": "345-678-9012"
    },
    "review": {
        "_id": "60df26e8a2c4e82f644c018f",
        "rating": 4,
        "comment": "Beautiful landscapes, friendly staff."
    }
},
{
    "client": {
        "_id": "60df26e8a2c4e82f644c0190",
        "name": "Olivia White",
        "email": "olivia.white@example.com",
        "phone": "123-456-7890"
    },
    "review": {
        "_id": "60df26e8a2c4e82f644c0191",
        "rating": 5,
        "comment": "An amazing journey, will cherish the
memories forever!"
    }
},
{
    "client": {
        "_id": "60df26e8a2c4e82f644c0192",
        "name": "Ethan Harris",
        "email": "ethan.harris@example.com",
        "phone": "901-234-5678"
    },
    "review": {
        "_id": "60df26e8a2c4e82f644c0193",
        "rating": 4,
        "comment": "Great experience, would love to do it
again!"
    }
}
]
}
]

```

```
}  
]
```

Zapytania i operacje

```
from pymongo import MongoClient  
  
port = "mongodb://localhost:27018/"  
db_name = "OwnMongoBase3"  
collection_name = "NestedVariant"  
client = MongoClient(port)  
db = client[db_name]  
collection = db[collection_name]  
  
# Wszystkie firmy  
# W tym wariancie jest to bardzo proste  
companies = collection.find({}, {"company.name": 1, "_id": 0})  
for comp in companies:  
    print(comp["company"]["name"])  
  
# Klienci, którzy uczestniczyli w wycieczkach zorganizowanych przez "Northern  
Lights Expeditions"  
# W tym wariancie jest wymaga do użycia agregacji i wielu operacji unwinding  
northern_lights_attendees = collection.aggregate([  
    {"$match": {"company.name": "Northern Lights Expeditions"}},  
    {"$unwind": "$Trips"},  
    {"$unwind": "$Trips.attendants"},  
    {"$project": {"_id": 0, "client": "$Trips.attendants.client"}}  
)  
for attendee in northern_lights_attendees:  
    print(attendee)  
  
# Wycieczki z Johnem Doe jako uczestnikiem  
# W tym wariancie wymaga to zagnieżdżonych pętli przy printowaniu  
john_doe_trips = collection.find({"Trips.attendants.client.name": "John Doe"})  
for doc in john_doe_trips:  
    for trip in doc["Trips"]:  
        print(trip["details"]["name"])  
  
# Średnia ocena wszystkich wycieczek  
# W tym wariancie wymaga to kolejny raz użycia agregacji  
average_rating = collection.aggregate([  
    {"$unwind": "$Trips"},  
    {"$unwind": "$Trips.attendants"},  
    {"$group": {"_id": None, "avgRating": {"$avg":  
"$Trips.attendants.review.rating"}}}  
)  
for result in average_rating:  
    print("\nAverage rating of all trips:", result["avgRating"])  
  
client.close()
```

Wnioski

Wariant Pierwszy (wszystko w jednym pliku) posiada jedną zaletę i jest nią łatwość wczytania danych. Oprócz tego posiada dużo wad między innymi jego struktura jest bardzo mało czytelna Wariant Drugi (każda kolekcja w osobnym pliku) jest najbardziej czytelny i łatwy do zrozumienia oraz jego query też wyglądają najlepiej Wariant Trzeci (zagnieżdżone elementy) jest najbardziej skomplikowany i wymaga najwięcej operacji do wykonania natomiast jest najbardziej czytelny kiedy chcemy samemu znaleźć coś w pliku json

Podsumowując, najlepszym wariantem jest Wariant Drugi który przypomina także dużo bardziej typowe relacyjne bazy danych (SQL) co pokazuje, że mimo zmiany podejścia do zarządzania danymi w bazanach No-SQL, struktura zaproponowana w bazach relacyjnych pozostaje aktualna i zapewnia szerokie możliwości operowania danymi w prosty i przystępny sposób.

Punktacja:

zadanie	pkt
1	0,6
2	1,4
razem	2