NoSQL queries

Query-1: Unveiling Popular Choices: Top 5 Most Booked Listings and Their Neighborhoods.

Our focus is to Identify the top five listings that are attracting the most bookings, providing insights into customer preferences and popular neighborhoods. This analysis will guide our strategies in marketing and customer engagement, helping us understand where demand is concentrated and what locations are trending among our users.

```
db.bookings.aggregate([
   {
     $group: {
        _id: "$listing_id",
        totalBookings: { $sum: 1 }
     }
   },
   { $sort: { totalBookings: -1 } },
   { $limit: 5 },
   {
     $lookup: {
        from: "listings",
        localField: "_id",
        foreignField: "id",
        as: "listing_details"
     }
   },
   { $unwind: "$listing_details" },
   {
     $lookup: {
        from: "neighbourhood",
        localField: "listing_details.neighbourhood_id",
        foreignField: "neighbourhood_id",
        as: "neighbourhood_details"
     }
   },
   { $unwind: "$neighbourhood_details" },
   {
     $project: {
        _id: 0,
        listing_id: "$_id",
        totalBookings: 1,
        neighbourhood: "$neighbourhood_details.neighbourhood"
     }
   }
])
```

Output:

```
>_MONGOSH
< {
    average_review_rating: 5,
    listing_id: 7826,
    neighbourhood_name: 'Back Bay'
  }
  {
    average_review_rating: 5,
    listing_id: 9077,
    neighbourhood_name: 'Brighton'
  }
  {
    average_review_rating: 5,
    listing_id: 4149,
    neighbourhood_name: 'East Boston'
  }
  {
    average_review_rating: 5,
    listing_id: 1215,
    neighbourhood_name: 'South End'
  }
  {
    average_review_rating: 5,
    listing_id: 5533,
    neighbourhood_name: 'Dorchester'
  }
```

Query-2: Identifying Our Best Listings: A Closer Look at Customer Favorites

We're finding out which five listings our customers love the most by looking at their ratings and how often they're reviewed. This helps us see what's working well and which neighborhoods are most popular.

```
db.reviews.aggregate([
   {
     $group: {
        _id: "$listing_id",
        average_review_rating: { $avg: "$review_rating" },
        count_reviews: { $sum: 1 } // Count the number of reviews for each listing
     }
   },
   { $sort: { average_review_rating: -1, count_reviews: -1 } }, // Sort by average rating,
then by count of reviews
   { $limit: 5 },
   {
     $lookup: {
        from: "listings",
        localField: "_id",
```

```
          foreignField: "id",
          as: "listing_details"
        }
    },
    { $unwind: "$listing_details" },
    {
        $lookup: {
          from: "neighbourhood",
          localField: "listing_details.neighbourhood_id",
          foreignField: "neighbourhood_id",
          as: "neighbourhood_details"
        }
    },
    { $unwind: "$neighbourhood_details" },
    {
        $project: {
          _id: 0,
          listing_id: "$_id",
          average_review_rating: 1,
          neighbourhood_name: "$neighbourhood_details.neighbourhood"
        }
    }
])
```

Output

```
>_MONGOSH
< {
    average_review_rating: 5,
    listing_id: 7826,
    neighbourhood_name: 'Back Bay'
  }
  {
    average_review_rating: 5,
    listing_id: 9077,
    neighbourhood_name: 'Brighton'
  }
  {
    average_review_rating: 5,
    listing_id: 4149,
    neighbourhood_name: 'East Boston'
  }
  {
    average_review_rating: 5,
    listing_id: 1215,
    neighbourhood_name: 'South End'
  }
  {
    average_review_rating: 5,
    listing_id: 5533,
    neighbourhood_name: 'Dorchester'
  }
```

Query-3: Neighbourhood Licensing Trends

Spotlighting trends in licensed and unlicensed properties across different areas. See top 5 neighbourhoods with most licensed listings

```
db.listings.aggregate([
    {
      $group: {
        _id: "$neighbourhood_id",
        licensedCount: { sum: {  $cond: [{ $ne: ["$license", null] }, 1, 0] } },
        unlicensedCount: { sum: {  $cond: [{ $eq: ["$license", null] }, 1, 0]  } }
      }
    },
    {
      $lookup: {
        from: "neighbourhood",
        localField: "_id",
        foreignField: "neighbourhood_id",
        as: "neighbourhood_info"
      }
    },
    {
      $unwind: "$neighbourhood_info"
    },
    {
      $project: {
        _id: 0,
        neighbourhoodName: "$neighbourhood_info.neighbourhood",
        licensedCount: 1,
        unlicensedCount: 1
      }
    },
    {
      $sort: { licensedCount: -1}
    },
    {
      $limit: 5
    }
])
```

Output

```
>_MONGOSH

< {
    licensedCount: 493,
    unlicensedCount: 0,
    neighbourhoodName: 'Dorchester'
  }
  {
    licensedCount: 343,
    unlicensedCount: 0,
    neighbourhoodName: 'Downtown'
  }
  {
    licensedCount: 326,
    unlicensedCount: 0,
    neighbourhoodName: 'Back Bay'
  }
  {
    licensedCount: 292,
    unlicensedCount: 0,
    neighbourhoodName: 'Roxbury'
  }
  {
    licensedCount: 286,
    unlicensedCount: 0,
    neighbourhoodName: 'South End'
  }
```

Query-4: Responsiveness of super hosts in different Neighbourhoods

(a) Neighbourhoods with most responsive super hosts: This query returns the top 3 neighbourhoods with highest average response rate of super hosts.

```
db.hosts.aggregate([
  {
    $match: { host_is_superhost: true, },
  },
  {
    $group: {
      _id: "$host_neighbourhood",
      average_response_rate: {
        $avg: "$host_response_rate",
      },
    },
  },
  {
    $sort: {  average_response_rate: -1, },
  },
```

```
  {
    $limit: 3,
  },
  {
    $project: {
      _id: 0,
      host_neighbourhood: "$_id",
      average_response_rate: 1,
    },
  },
])
```

Output

```
< {
    average_response_rate: 100,
    host_neighbourhood: 'Coolidge Corner'
  }
  {
    average_response_rate: 100,
    host_neighbourhood: 'Rockport'
  }
  {
    average_response_rate: 100,
    host_neighbourhood: 'East Downtown'
  }
```

(b) Neighbourhoods with most responsive super hosts(an area to focus on). This query
returns the 3 neighbourhoods with lowest average response rate of super hosts.

```
db.hosts.aggregate([
  {
    $match: { host_is_superhost: true, },
  },
  {
    $group: {
      _id: "$host_neighbourhood",
      average_response_rate: {
        $avg: "$host_response_rate",
      },
    },
  },
  {
```

```
      $sort: {  average_response_rate: 1, },
    },
    {
     $limit: 3,
    },
    {
     $project: {
       _id: 0,
       host_neighbourhood: "$_id",
       average_response_rate: 1,
     },
    },
  ])
```

Output

```
>_MONGOSH
]/
< {
    average_response_rate: 0,
    host_neighbourhood: 'Harbor View / Orient Heights'
  }
  {
    average_response_rate: 50,
    host_neighbourhood: 'Franklin Field North'
  }
  {
    average_response_rate: 80,
    host_neighbourhood: 'Fenway/Kenmore'
  }
```