ECE:5845 Modern Databases HW6

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Part One

Index Creation
db.business.createIndex({ location: "2dsphere" })

Index Stats:
The 2DSphere Index Size -> 2,300 KB
The Collection Size -> 132,153 KB

Query One
```
db.business.find({
  location: {
    $near: {
      $geometry: {
        type: "Point",
        coordinates: [-81.4780020341, 28.4519912466]
      }
    }
  }
}).limit(1)
```

Result One
```
[
  {
    _id: ObjectId("617b521a6974ec8b96b93b76"),
    business_id: 'D3HhzY2UwaNTaN-e_S-hCw',
    name: 'Sweetwater Car Wash',
    address: '7659 Majorca Pl',
    city: 'Orlando',
    state: 'FL',
    postal_code: '32836',
    stars: 4,
    review_count: 171,
    is_open: 1,
```

```
   attributes: { WiFi: "u'free'", BusinessAcceptsCreditCards: 'True' },
   categories: 'Car Wash, Automotive',
   hours: {
     Monday: '8:0-18:0',
     Tuesday: '8:0-18:0',
     Wednesday: '8:0-18:0',
     Thursday: '8:0-18:0',
     Friday: '8:0-18:0',
     Saturday: '8:0-18:0',
     Sunday: '9:0-17:0'
   },
   location: { type: 'Point', coordinates: [ -81.4780020341, 28.4519912466 ] }
 }
]
```

Query Two

```
db.business.find({
  location: {
    $geoWithin: {
      $geometry: {
        type: "Polygon",
        coordinates: [[
          [-81.47602558135986, 28.451751000365167],
          [-81.47530674934387, 28.453703611765697],
          [-81.47952318191528, 28.453807372715158],
          [-81.4800703525543, 28.45156234034854],
          [-81.47602558135986, 28.451751000365167]
        ]]
      }
    }
  }
}, {
  name: 1,
  _id: 0
})
```

For getting the number of businesses in the region, just add ".count()" to the end of the query above. Yields these results:

Result(s) Two

```
[
  { name: 'Graffiti Junktion Dr. Phillips' },
  { name: 'Memories of India Indian Cuisine' },
  { name: 'La Boucherie' },
  { name: 'Bay Hill First Nail' },
  { name: 'King Cajun Crawfish | Dr Phillips' },
  { name: 'Southern Spice Indian Cuisine' },
  { name: "Chutney's Indian Restaurant" },
  { name: 'Kabooki Sushi Sandlake' },
  { name: 'Kokino Tapas & Cocktails' },
  { name: 'Goldfingers Aesthetics' },
  { name: 'Fresco Cucina Italiana' },
  { name: 'Cleopatra Hookah Lounge' },
  { name: 'Fitness CF' },
  { name: "Gold's Gym" },
  { name: 'Tire Kingdom' },
  { name: '168 Chinese' },
  { name: 'Khush-Threading & Herbal Salon' },
  { name: "Dewey's Indoor Golf & Sports Grill" },
  { name: 'Groovy Goat' },
  { name: 'Tomkos Tavern Wood-Fired Pizza & BBQ' }
]
```

Had to type "it" to show more results

```
[
  { name: 'Lake House By Alta' },
  { name: 'Sweetwater Car Wash' },
  { name: "Wendy's" }
]
```

Count of businesses in region:
```
23
```

Query Three
```
db.business.find(
  {
    location: {
      $near: {
        $geometry: {
```

```
      type: "Point",
      coordinates: [-81.4780020341, 28.4519912466] // [longitude, latitude]
    }
  }
},
  categories: /restaurants/i // Case-insensitive regex match for "restaurants" in
categories
 },{
  name: 1,
  _id: 0
}
).limit(5)
```

Result Three

```
[
 { name: "Dewey's Indoor Golf & Sports Grill" },
 { name: 'Gyu-Kaku Japanese BBQ' },
 { name: "Wendy's" },
 { name: 'Tomkos Tavern Wood-Fired Pizza & BBQ' },
 { name: 'Groovy Goat' }
]
```

Part Two

Index Creation
```
db.collection.createIndex({
  name: "text",
  city: "text",
  state: "text",
  categories: "text"
})
```

Index Stats
The Text Index Size -> 19,200 KB
The Collection Size -> 132,153 KB

Query One

```
db.business.find(
  {
    $text: {
      $search: "\"family\" \"fun\" \"entertainment\"",
      $language: "english",
      $caseSensitive: false,
    },
    stars: { $gte: 4 }
  },
  {
    _id: 0,
    name: 1,
    city: 1,
    state: 1,
    categories: 1,
    stars: 1
  }
).sort({ stars: -1, name: 1 })
```

Result One

```
[
  {
    name: 'Family Fun Town',
    city: 'Orange City',
    state: 'FL',
    stars: 4,
    categories: 'Active Life, Mini Golf, Arts & Entertainment, Batting Cages, Arcades, Go
Karts'
  },
  {
    name: 'Happy Days Family Fun Center',
    city: 'Kissimmee',
    state: 'FL',
    stars: 4,
    categories: 'Arcades, Event Planning & Services, Kids Activities, Venues & Event
Spaces, Arts & Entertainment, Active Life, Nightlife, Amusement Parks, Restaurants,
Fast Food'
  }
]
```

Query Two

```
db.business.find(
  {
    $text: {
      $search: "\"grill\" \"cheese\"",
      $language: "english",
      $caseSensitive: false,
    },
    city: "Portland",
  },
  {
    _id: 0,
    name: 1,
    city: 1,
    state: 1,
    categories: 1,
    stars: 1
  }
).sort({ stars: -1, name: 1 })
```

Result Two

```
[
  {
    name: "Zeek's Cheese Grill",
    city: 'Portland',
    state: 'OR',
    stars: 5,
    categories: 'Sandwiches, Street Vendors, Restaurants, Food'
  },
  {
    name: "Garcelon's soup & grilled cheese",
    city: 'Portland',
    state: 'OR',
    stars: 4.5,
    categories: 'Sandwiches, Food Stands, Soup, Restaurants'
  },
  {
    name: "Christopher's Gourmet Grill",
    city: 'Portland',
```

```
    state: 'OR',
    stars: 4,
    categories: 'Food, Desserts, Restaurants, Cheesesteaks, Barbeque, Burgers'
  },
  {
    name: "Doc's Cheese Grill",
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'American (Traditional), Sandwiches, Restaurants, Salad'
  },
  {
    name: 'The Grilled Cheese Grill',
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'Food Stands, Sandwiches, Restaurants'
  },
  {
    name: 'The Grilled Cheese Grill',
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'Sandwiches, Food Stands, Restaurants'
  },
  {
    name: 'The Grilled Cheese Grill',
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'Local Flavor, Food Stands, Sandwiches, Food, Street Vendors,
Restaurants'
  },
  {
    name: "Zeek's Cheese Grill",
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'Sandwiches, American (New), Food, Food Trucks, Restaurants'
  },
```

```
  {
    name: "Zeek's Cheese Grill",
    city: 'Portland',
    state: 'OR',
    stars: 4,
    categories: 'American (New), Food, American (Traditional), Food Trucks,
Restaurants'
  }
]
```

Query Three
```
db.business.find(
  {
    $text: {
      $search: "bar -brewery -restaurant",
      $language: "english",
      $caseSensitive: false
    },
    state: "FL"
  },
  {
    _id: 0,
    name: 1,
    city: 1,
    state: 1,
    categories: 1,
    stars: 1
  }
).sort({ stars: -1, name: 1 }).limit(10)
```

Result Three
```
[
  {
    name: 'Abstract Orlando',
    city: 'Orlando',
    state: 'FL',
    stars: 5,
    categories: 'Art Classes, Education, Bars, Nightlife, Coffee & Tea, Food, Arts &
Entertainment, Lounges, Event Planning & Services, Art Galleries, Paint & Sip,
Shopping, Venues & Event Spaces'
```

```
  },
  {
    name: 'Albasha Hookah Lounge',
    city: 'Orlando',
    state: 'FL',
    stars: 5,
    categories: 'Hookah Bars, Food, Nightlife, Bars, Coffee & Tea'
  },
  {
    name: 'Ash Taproom',
    city: 'Orlando',
    state: 'FL',
    stars: 5,
    categories: 'Shopping, Music Venues, Nightlife, Lounges, Cocktail Bars, Cigar Bars,
Arts & Entertainment, Tobacco Shops, Bars'
  },
  {
    name: "Bahama Buck's",
    city: 'Orlando',
    state: 'FL',
    stars: 5,
    categories: 'Juice Bars & Smoothies, Food, Acai Bowls, Desserts, Shaved Ice'
  },
  {
    name: 'Bar B',
    city: 'Orlando',
    state: 'FL',
    stars: 5,
    categories: 'Lounges, Nightlife, Bars, Cocktail Bars'
  },
  {
    name: 'Benefit Brow Bar at Ulta',
    city: 'Winter Park',
    state: 'FL',
    stars: 5,
    categories: 'Shopping, Cosmetics & Beauty Supply, Makeup Artists, Hair Removal,
Beauty & Spas'
  },
  {
    name: 'Cigar Hustler',
```

```
    city: 'Deltona',
    state: 'FL',
    stars: 5,
    categories: 'Shopping, Tobacco Shops, Head Shops, Tattoo, Beer Bar, Bars, Nightlife,
Vape Shops, Beauty & Spas'
  },
  {
   name: "Conrad's Shanty",
   city: 'Orlando',
   state: 'FL',
   stars: 5,
   categories: 'Beer Bar, Bars, Pubs, Nightlife'
  },
  {
   name: 'Digress Wine',
   city: 'Orlando',
   state: 'FL',
   stars: 5,
   categories: 'Nightlife, Education, Wine Bars, Beer, Wine & Spirits, Food, Bars, Tasting
Classes'
  },
  {
   name: 'Embassy Irish Bar',
   city: 'Orlando',
   state: 'FL',
   stars: 5,
   categories: 'Nightlife, Pubs, Bars, Irish Pub, Bar Crawl'
  }
]
```

Query Four
```
db.business.find(
  {
   $text: {
     $search: "family fun entertainment",
     $language: "english",
     $caseSensitive: false,
   },
   state: "FL"
  },
```

```
  {
    _id: 0,
    name: 1,
    city: 1,
    state: 1,
    categories: 1,
    stars: 1,
  }
).sort({ score: { $meta: 'textScore' }}).limit(5)
```

Result Four

```
[
  {
    name: 'Family Fun Town',
    city: 'Orange City',
    state: 'FL',
    stars: 4,
    categories: 'Active Life, Mini Golf, Arts & Entertainment, Batting Cages, Arcades, Go Karts'
  },
  {
    name: "Hukoo's Family Fun",
    city: 'Orlando',
    state: 'FL',
    stars: 3,
    categories: 'Arts & Entertainment, Kids Activities, Party & Event Planning, Active Life, Venues & Event Spaces, Party Supplies, Event Planning & Services, Arcades, Laser Tag, Trampoline Parks'
  },
  {
    name: 'Happy Days Family Fun Center',
    city: 'Kissimmee',
    state: 'FL',
    stars: 4,
    categories: 'Arcades, Event Planning & Services, Kids Activities, Venues & Event Spaces, Arts & Entertainment, Active Life, Nightlife, Amusement Parks, Restaurants, Fast Food'
  },
  {
    name: 'Picture Show Entertainment',
```

```
    city: 'Altamonte Springs',
    state: 'FL',
    stars: 4,
    categories: 'Arts & Entertainment, Cinema'
  },
  {
    name: 'Fun Games',
    city: 'Kissimmee',
    state: 'FL',
    stars: 4,
    categories: 'Arcades, Active Life, Kids Activities, Arts & Entertainment'
  }
]
```