

任务1:MySQL for JSON

a) . JSON基本查询:

1.在business表中,查询city位于Tampa的商户所有信息,按被评论数降序排序,限制返回10条.

共10行,此处展示前三行

business_id	business_info
QHWWYImVbLC3K6egIWoHVvA	["city": "Tampa", "name": "Datz", "hours": {"Friday": "7:0-23:0", "Monday": "0:0-0:0", "Sunday": "8:30-21:0", "Tuesday": "7:0-22:0", "Saturday": "8:30-23:0", "Thursday": "7:0-22:0", "Wednesday": "7:0-22:0"}, "stars": 4.0, "state": "FL", "address": "2616 S MacDill Ave", "is_open": 1, "latitude": 27.921942, "longitude": -82.4932535, "attributes": {"BYOB": "False", "WiFi": "u'free", "HasTV": "True", "Music": {"(dj": "False", "background_music": "True", "no_music": "False", "jukebox": "False", "live": "False", "video": "False", "karaoke": "False"}, "Caters": "True", "Alcohol": "u'full_bar", "Ambience": {"(touristy": "False", "hipster": "False", "romantic": "False", "divvey": "False", "intimate": "False", "trendy": "True", "upscale": "False", "classy": "True", "casual": "True"}, "DriveThru": "True", "HappyHour": "True", "BestNights": {"(monday": "False", "tuesday": "False", "friday": "True", "wednesday": "False", "thursday": "True", "sunday": "False", "saturday": "True"}, "NoiseLevel": "u'average", "BikeParking": "True", "DogsAllowed": "True", "GoodForKids": "True", "GoodForMeal": {"(dessert": "None", "latenight": "False", "lunch": "True", "dinner": "True", "brunch": "True", "breakfast": "None"}, "OutdoorSeating": "True", "BusinessParking": {"(garage": "False", "street": "True", "validated": "False", "lot": "True", "valet": "False"}, "ByAppointmentOnly": "False", "RestaurantsAttire": "u'casual", "RestaurantsTakeOut": "True", "RestaurantsDelivery": "True", "WheelchairAccessible": "True", "BusinessAcceptsBitcoin": "False", "RestaurantsPriceRange2": "2", "RestaurantsReservations": "True", "RestaurantsTableService": "True", "RestaurantsGoodForGroups": "True", "BusinessAcceptsCreditCards": "True"}, "categories": "Burgers, Bars, Restaurants, American (Traditional), Vegan, Asian Fusion, Cocktail Bars, Breakfast & Brunch, Soul Food, Sandwiches, American (New), Gastropubs, Comfort Food, Nightlife, Wine Bars, Delis", "postal_code": "33629", "review_count": 3260}
L5LLN0RaFvI1Z9cddzvCw	["city": "Tampa", "name": "Ulele", "hours": {"Friday": "11:0-21:15", "Monday": "0:0-0:0", "Sunday": "11:0-22:0", "Tuesday": "11:0-22:0", "Saturday": "11:0-23:0", "Thursday": "11:0-22:0", "Wednesday": "11:0-22:0"}, "stars": 4.0, "state": "FL", "address": "1810 N Highland Ave", "is_open": 1, "latitude": 27.9601605512, "longitude": -82.4625296518, "attributes": {"WiFi": "u'free", "HasTV": "False", "Caters": "False", "Alcohol": "full_bar", "Ambience": {"(touristy": "False", "hipster": "False", "romantic": "False", "divvey": "False", "intimate": "False", "trendy": "True", "upscale": "False", "classy": "True", "casual": "False"}, "HappyHour": "False", "NoiseLevel": "u'average", "BikeParking": "True", "DogsAllowed": "True", "GoodForKids": "True", "GoodForMeal": {"(dessert": "False", "latenight": "False", "lunch": "True", "dinner": "True", "brunch": "False", "breakfast": "False"}, "OutdoorSeating": "True", "BusinessParking": {"(garage": "False", "street": "True", "validated": "False", "lot": "True", "valet": "True"}, "ByAppointmentOnly": "False", "RestaurantsAttire": "casual", "RestaurantsTakeOut": "True", "RestaurantsDelivery": "None", "WheelchairAccessible": "True", "RestaurantsPriceRange2": "2", "RestaurantsReservations": "True", "RestaurantsTableService": "True", "RestaurantsGoodForGroups": "True", "BusinessAcceptsCreditCards": "True"}, "categories": "Breweries, Food, American (New), Beer, Wine & Spirits, Restaurants, Seafood", "postal_code": "33602", "review_count": 3064}
dsfRniRgfbDjC8os848B6A	["city": "Tampa", "name": "Bern's Steak House", "hours": {"Friday": "16:0-23:0", "Monday": "17:0-22:0", "Sunday": "17:0-22:0", "Tuesday": "17:0-22:0", "Saturday": "18:0-23:0", "Thursday": "17:0-22:0", "Wednesday": "17:0-22:0"}, "stars": 4.5, "state": "FL", "address": "1208 S Howard Ave", "is_open": 1, "latitude": 27.9318624, "longitude": -82.4827004, "attributes": {"BYOB": "False", "WiFi": "u'no", "HasTV": "False", "Caters": "False", "Alcohol": "False", "Corkage": "True", "Ambience": {"(romantic": "False", "intimate": "False", "classy": "True", "hipster": "False", "divvey": "False", "touristy": "False", "trendy": "False", "upscale": "True", "casual": "False"}, "HappyHour": "False", "NoiseLevel": "u'average", "BYOBCorkage": "yes_corkage", "BikeParking": "True", "DogsAllowed": "False", "GoodForKids": "False", "GoodForMeal": {"(dessert": "True", "latenight": "False", "lunch": "False", "dinner": "True", "brunch": "False", "breakfast": "False"}, "OutdoorSeating": "False", "BusinessParking": {"(garage": "False", "street": "False", "validated": "False", "lot": "False", "valet": "True"}, "RestaurantsAttire": "dressy", "RestaurantsTakeOut": "False", "RestaurantsDelivery": "False", "WheelchairAccessible": "True", "BusinessAcceptsBitcoin": "False", "RestaurantsPriceRange2": "4", "RestaurantsReservations": "True", "RestaurantsTableService": "True", "RestaurantsGoodForGroups": "True", "BusinessAcceptsCreditCards": "True"}, "categories": "Arts & Entertainment, Steakhouses, Restaurants", "postal_code": "33606", "review_count": 2924}

2.在business表中,查询前五条记录的business_info列和business_info中attributes的所有键,以json数组形式返回,同时返回对应键的数量.

共5行

keys_info	key_num	info_keys	keys_attr	key_num_attr
["city", "name", "hours", "stars", "state", "address", "is_open", "latitude", "longitude", "attributes", "categories", "postal_code", "review_count"]	13		NULL	NULL
["city", "name", "hours", "stars", "state", "address", "is_open", "latitude", "longitude", "attributes", "categories", "postal_code", "review_count"]	13		["WiFi", "HasTV", "Ambience", "DriveThru", "BikeParking", "GoodForKids", "GoodForMeal", "OutdoorSeating", "BusinessParking", "RestaurantsAttire", "RestaurantsTakeOut", "RestaurantsDelivery", "RestaurantsPriceRange2", "RestaurantsReservations", "RestaurantsGoodForGroups", "BusinessAcceptsCreditCards"]	16
["city", "name", "hours", "stars", "state", "address", "is_open", "latitude", "longitude", "attributes", "categories", "postal_code", "review_count"]	13		["BYOB", "WiFi", "HasTV", "Caters", "Alcohol", "Corkage", "Ambience", "BikeParking", "GoodForMeal", "OutdoorSeating", "BusinessParking", "RestaurantsAttire", "RestaurantsTakeOut", "RestaurantsDelivery", "WheelchairAccessible", "RestaurantsPriceRange2", "RestaurantsReservations", "RestaurantsTableService", "BusinessAcceptsCreditCards"]	19
["city", "name", "hours", "stars", "state", "address", "is_open", "latitude", "longitude", "attributes", "categories", "postal_code", "review_count"]	13		["BikeParking", "DogsAllowed", "GoodForKids", "BusinessParking", "ByAppointmentOnly", "BusinessAcceptsCreditCards"]	6
["city", "name", "hours", "stars", "state", "address", "is_open", "latitude", "longitude", "attributes", "categories", "postal_code", "review_count"]	13		["WiFi", "HasTV", "Caters", "Ambience", "DriveThru", "GoodForKids", "GoodForMeal", "OutdoorSeating", "BusinessParking", "RestaurantsAttire", "RestaurantsTakeOut", "RestaurantsDelivery", "RestaurantsPriceRange2", "RestaurantsReservations", "RestaurantsGoodForGroups", "BusinessAcceptsCreditCards"]	16

3.在business表中,查询该表business_info列中name, stars, attributes的内容和JSON类型,限制返回行数为5.

name	name_type	stars	stars_type	attributes	attributes_type
"PHLASH"	STRING	3.5	DOUBLE	null	NULL
"McDonald's"	STRING	1.5	DOUBLE	["WiFi": "free", "HasTV": "True", "Ambience": {"(touristy": "False", "hipster": "False", "romantic": "False", "divvey": "False", "intimate": "False", "trendy": "False", "upscale": "False", "classy": "False", "casual": "False"}, "DriveThru": "True", "BikeParking": "False", "GoodForKids": "True", "GoodForMeal": {"(dessert": "False", "latenight": "False", "lunch": "False", "dinner": "False", "brunch": "False", "breakfast": "False"}, "OutdoorSeating": "False", "BusinessParking": {"(garage": "False", "street": "False", "validated": "False", "lot": "False", "valet": "False"}, "RestaurantsAttire": "casual", "RestaurantsTakeOut": "True", "RestaurantsDelivery": "True", "RestaurantsPriceRange2": "1", "RestaurantsReservations": "False", "RestaurantsGoodForGroups": "True", "BusinessAcceptsCreditCards": "True"}]	OBJECT
"Cafe Baladi"	STRING	5.0	DOUBLE	{BYOB": "True", "WiFi": "u'free", "HasTV": "True", "Caters": "True", "Alcohol": "u'none", "Corkage": "False", "Ambience": {"(touristy": "None", "hipster": "None", "romantic": "None", "divvey": "None", "intimate": "None", "trendy": "None", "upscale": "None", "classy": "None", "casual": "True"}, "BikeParking": "True", "GoodForMeal": {"(dessert": "False", "latenight": "False", "lunch": "False", "dinner": "False", "brunch": "False", "breakfast": "False"}, "OutdoorSeating": "True", "BusinessParking": {"(garage": "False", "street": "False", "validated": "False", "lot": "False", "valet": "False"}, "RestaurantsAttire": "u'casual", "RestaurantsTakeOut": "True", "RestaurantsDelivery": "True", "WheelchairAccessible": "True", "RestaurantsPriceRange2": "2", "RestaurantsReservations": "False", "RestaurantsTableService": "True", "BusinessAcceptsCreditCards": "True"}]	OBJECT
"Sunwest Park"	STRING	3.5	DOUBLE	{BikeParking": "True", "DogsAllowed": "False", "GoodForKids": "True", "BusinessParking": {"(garage": "False", "street": "False", "validated": "False", "lot": "True", "valet": "False"}, "ByAppointmentOnly": "False", "BusinessAcceptsCreditCards": "True"}]	OBJECT
"Chick-fil-A"	STRING	3.5	DOUBLE	["WiFi": "u'free", "HasTV": "True", "Caters": "True", "Ambience": {"(romantic": "False", "intimate": "False", "classy": "False", "hipster": "False", "divvey": "False", "touristy": "False", "trendy": "False", "upscale": "False", "casual": "False"}, "DriveThru": "True", "GoodForKids": "True", "GoodForMeal": {"(dessert": "False", "latenight": "False", "lunch": "False", "dinner": "False", "brunch": "False", "breakfast": "False"}, "OutdoorSeating": "True", "BusinessParking": {"(garage": "False", "street": "False", "validated": "False", "lot": "False", "valet": "False"}, "RestaurantsAttire": "casual", "RestaurantsTakeOut": "True", "RestaurantsDelivery": "True", "RestaurantsPriceRange2": "1", "RestaurantsReservations": "False", "RestaurantsGoodForGroups": "False", "BusinessAcceptsCreditCards": "True"}]	OBJECT

4.在business表中,查询拥有电视("HasTV"是"True")且星期天不营业(Sunday键不存在,当然也可以hours键不存在,即is null)的商户,返回它的名字(不带双引号),属性,营业时间,并按名字升序排序,限制10条记录.

共10行,此处展示前5行

name	attributes	open_time
'Ono Poke Co	{'WiFi': 'u'no', 'HasTV': 'True', 'Alcohol': 'none', 'Ambience': '{'touristy': False, 'hipster': False, 'romantic': False, 'intimate': False, 'trendy': False, 'upscale': False, 'classy': False, 'casual': True}, 'NoiseLevel': 'u'average', 'BikeParking': 'True', 'GoodForKids': 'True', 'GoodForMeal': '{'dessert': False, 'latenight': False, 'lunch': True, 'dinner': False, 'brunch': False, 'breakfast': False}, 'OutdoorSeating': 'True', 'BusinessParking': '{'garage': False, 'street': True, 'validated': False, 'lot': False, 'valet': False}, 'RestaurantsAttire': 'u'casual', 'RestaurantsTakeOut': 'True', 'RestaurantsDelivery': 'True', 'RestaurantsPriceRange2': '2', 'RestaurantsReservations': 'False', 'RestaurantsTableService': 'False', 'RestaurantsGoodForGroups': 'True'}	{'Friday': '11:0-21:0', 'Monday': '11:0-21:0', 'Tuesday': '11:0-21:0', 'Saturday': '11:0-21:0', 'Thursday': '11:0-21:0', 'Wednesday': '11:0-21:0'}
09 Pub	{'HasTV': 'True', 'Music': '{'dj': False, 'background_music': False, 'no_music': False, 'jukebox': False, 'live': False, 'video': False, 'karaoke': False}, 'Alcohol': 'u'full_bar', 'Smoking': 'u'outdoor', 'Ambience': '{'touristy': False, 'hipster': False, 'romantic': False, 'diver': True, 'intimate': False, 'trendy': False, 'upscale': False, 'classy': False, 'casual': False}, 'CoatCheck': 'False', 'HappyHour': 'True', 'BestNights': '{'monday': False, 'tuesday': False, 'friday': True, 'wednesday': True, 'thursday': False, 'sunday': False, 'saturday': True}, 'NoiseLevel': 'u'average', 'BikeParking': 'True', 'GoodForDancing': 'False', 'OutdoorSeating': 'False', 'BusinessParking': '{'garage': False, 'street': False, 'validated': False, 'lot': False, 'valet': False}, 'RestaurantsPriceRange2': '1', 'RestaurantsReservations': 'False', 'RestaurantsGoodForGroups': 'False', 'BusinessAcceptsCreditCards': 'False'}	null
1 Night Stand	{'HasTV': 'True', 'Music': '[]', 'Alcohol': 'full_bar', 'Ambience': '{'romantic': False, 'intimate': False, 'classy': False, 'hipster': False, 'diver': False, 'touristy': False, 'trendy': False, 'upscale': False, 'casual': False}, 'CoatCheck': 'False', 'NoiseLevel': 'u'quiet', 'BikeParking': 'False', 'GoodForDancing': 'True', 'OutdoorSeating': 'False', 'BusinessParking': '{'garage': False, 'street': False, 'validated': False, 'lot': False, 'valet': False}, 'RestaurantsPriceRange2': '1', 'RestaurantsReservations': 'False', 'RestaurantsGoodForGroups': 'True', 'BusinessAcceptsCreditCards': 'True'}	{'Friday': '21:0-1:15', 'Saturday': '21:0-1:15'}
1 Up	{'HasTV': 'True', 'Alcohol': 'full_bar', 'Ambience': '{'romantic': False, 'intimate': False, 'classy': False, 'hipster': False, 'diver': False, 'touristy': False, 'trendy': False, 'upscale': False, 'casual': False}, 'HappyHour': 'True', 'BikeParking': 'True', 'GoodForDancing': 'True', 'OutdoorSeating': 'False', 'RestaurantsPriceRange2': '2', 'RestaurantsReservations': 'False', 'RestaurantsGoodForGroups': 'True', 'BusinessAcceptsCreditCards': 'True'}	{'Friday': '22:0-4:0', 'Saturday': '22:0-4:0', 'Thursday': '22:0-4:0'}
10-01 Food & Drink	{'WiFi': 'u'free', 'HasTV': 'True', 'Caters': 'True', 'Alcohol': 'u'full_bar', 'Ambience': '{'romantic': False, 'intimate': False, 'touristy': False, 'hipster': False, 'diver': False, 'classy': False, 'trendy': True, 'upscale': False, 'casual': False}, 'NoiseLevel': 'u'average', 'BikeParking': 'True', 'GoodForKids': 'False', 'OutdoorSeating': 'True', 'BusinessParking': '{'garage': False, 'street': False, 'validated': False, 'lot': True, 'valet': False}, 'RestaurantsAttire': 'u'casual', 'RestaurantsTakeOut': 'True', 'RestaurantsDelivery': 'False', 'BusinessAcceptsBitcoin': 'False', 'RestaurantsPriceRange2': '2', 'RestaurantsReservations': 'True', 'RestaurantsGoodForGroups': 'True', 'BusinessAcceptsCreditCards': 'True'}	null

5.使用explain查看select * from user where user_info->'\$.name'='Wanda'的执行计划,其中执行计划按JSON格式输出;并且实际执行一次该查询,请注意观察语句消耗的时间并与MongoDB的查询方式进行对比(MongoDB要执行此查询要求,相应的语句是什么?执行计划是怎样的?并给出查询效率对比).

```
//MySQL下explain出的结果
{
  "query_block": {
    "select_id": 1,
    "cost_info": {
      "query_cost": "636696.00"
    },
    "table": {
      "table_name": "user",
      "access_type": "ALL",
      "rows_examined_per_scan": 2406280,
      "rows_produced_per_join": 2406280,
      "filtered": "100.00",
      "cost_info": {
        "read_cost": "396068.00",
        "eval_cost": "240628.00",
        "prefix_cost": "636696.00",
        "data_read_per_join": "275M"
      },
      "used_columns": [
        "user_id",
        "user_info"
      ],
      "attached_condition": "(json_extract(`test`.`user`.`user_info`, '$.name') = 'wanda')"
    }
  }
}

//MongoDB下explain出的结果
{
  queryPlanner: {
    plannerVersion: 1,
    namespace: 'yelp.user',
```

```

    indexFilterSet: false,
    parsedQuery: {
      name: {
        '$eq': 'wanda'
      }
    },
    winningPlan: {
      stage: 'COLLSCAN',
      filter: {
        name: {
          '$eq': 'wanda'
        }
      },
      direction: 'forward'
    },
    rejectedPlans: []
  },
  executionStats: {
    executionSuccess: true,
    nReturned: 226,
    executionTimeMillis: 17356,
    totalKeysExamined: 0,
    totalDocsExamined: 1637141,
    executionStages: {
      stage: 'COLLSCAN',
      filter: {
        name: {
          '$eq': 'wanda'
        }
      },
      nReturned: 226,
      executionTimeMillisEstimate: 13830,
      works: 1637143,
      advanced: 226,
      needTime: 1636916,
      needYield: 0,
      saveState: 2101,
      restoreState: 2101,
      isEOF: 1,
      direction: 'forward',
      docsExamined: 1637141
    }
  },
  serverInfo: {
    host: 'DESKTOP-A33Q313',
    port: 27017,
    version: '4.4.2',
    gitVersion: '15e73dc5738d2278b688f8929aee605fe4279b0e'
  },
  ok: 1
}

```

查询效率对比:

再output窗口可以看到,MySQL查询时间大约60秒

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	19:49:44	use test	0 row(s) affected	0.000 sec
2	19:50:06	select * from user where user_info->'name'='Wanda'	389 row(s) returned	0.656 sec / 59.813 sec

MongoDB查询时间根据explain的结果可知,执行时间大约为14秒

查询效率对比 : MySQL比MongoDB大约为1:4

b) . JSON增删改:

6.在busines表中,查询id为4r3Ck65DCG1T6gpWodPyrg的商户business_info,这里对info列的显示需要使用JSON_PRETTY(business_info)让可读性更高,然后在它的hours中新增"Tuesday":"16:0-23:0"的键值对,并将其评分改为4.5,属性的'WiFi'对应的值置为"Free",返回其business_info,也用JSON_PRETTY(business_info)展示在修改前后的差异.

修改前

```
{
  "city": "Saint Louis",
  "name": "Bridge Tap House and Wine Bar",
  "hours": {
    "Friday": "16:0-23:0",
    "Monday": "0:0-0:0",
    "Sunday": "16:0-23:0",
    "Saturday": "16:0-23:0",
    "Thursday": "16:0-23:0",
    "Wednesday": "16:0-23:0"
  },
  "stars": 4.0,
  "state": "MO",
  "address": "1004 Locust St",
  "is_open": 1,
  "latitude": 38.6298535973,
  "longitude": -90.1946710563,
  "attributes": {
    "WiFi": "u'no'",
    "HasTV": "False",
    "Music": '{"dj': False, 'background_music': False, 'no_music': False, 'jukebox': False, 'live': False, 'video': False, 'karaoke': False}",
    "Caters": "True",
    "Alcohol": "u'full_bar'",
    "Ambience": '{"touristy': False, 'hipster': False, 'romantic': False, 'divey': False, 'intimate': False, 'trendy': True, 'upscale': False, 'classy': True, 'casual': False}",
    "BestNights": '{"monday': True, 'tuesday': False, 'friday': True, 'wednesday': False, 'thursday': False, 'sunday': False, 'saturday': True}",
    "NoiseLevel": "u'average'",
    "BikeParking": "True",
    "DogsAllowed": "False",
    "GoodForKids": "False",
    "GoodForMeal": '{"dessert': False, 'latenight': True, 'lunch': None, 'dinner': True, 'brunch': False, 'breakfast': False}",
    "GoodForDancing": "False",
    "OutdoorSeating": "True",
```

```

    "BusinessParking": "{ 'garage': False, 'street': True, 'validated': False,
'lot': False, 'valet': False}",
    "RestaurantsAttire": "u'casual'",
    "RestaurantsTakeOut": "True",
    "RestaurantsDelivery": "True",
    "RestaurantsPriceRange2": "2",
    "RestaurantsReservations": "False",
    "RestaurantsGoodForGroups": "True",
    "BusinessAcceptsCreditCards": "True"
},
"categories": "Nightlife, Restaurants, Tapas/Small Plates, Bars, American
(New), Wine Bars, Beer Bar",
"postal_code": "63101",
"review_count": 752
}

```

修改后

```

{
  "city": "Saint Louis",
  "name": "Bridge Tap House and Wine Bar",
  "hours": {
    "Friday": "16:0-23:0",
    "Monday": "0:0-0:0",
    "Sunday": "16:0-23:0",
    "Tuesday": "16:0-23:0",
    "Saturday": "16:0-23:0",
    "Thursday": "16:0-23:0",
    "Wednesday": "16:0-23:0"
  },
  "stars": 4.5,
  "state": "MO",
  "address": "1004 Locust St",
  "is_open": 1,
  "latitude": 38.6298535973,
  "longitude": -90.1946710563,
  "attributes": {
    "WiFi": "Free",
    "HasTV": "False",
    "Music": "{ 'dj': False, 'background_music': False, 'no_music': False,
'jukebox': False, 'live': False, 'video': False, 'karaoke': False}",
    "Caters": "True",
    "Alcohol": "u'full_bar'",
    "Ambience": "{ 'touristy': False, 'hipster': False, 'romantic': False,
'divey': False, 'intimate': False, 'trendy': True, 'upscale': False, 'classy':
True, 'casual': False}",
    "BestNights": "{ 'monday': True, 'tuesday': False, 'friday': True,
'wednesday': False, 'thursday': False, 'sunday': False, 'saturday': True}",
    "NoiseLevel": "u'average'",
    "BikeParking": "True",
    "DogsAllowed": "False",
    "GoodForKids": "False",
    "GoodForMeal": "{ 'dessert': False, 'latenight': True, 'lunch': None,
'dinner': True, 'brunch': False, 'breakfast': False}",
    "GoodForDancing": "False",
    "OutdoorSeating": "True",

```

```
    "BusinessParking": "{ 'garage': False, 'street': True, 'validated': False,
'lot': False, 'valet': False}",
    "RestaurantsAttire": "u'casual'",
    "RestaurantsTakeOut": "True",
    "RestaurantsDelivery": "True",
    "RestaurantsPriceRange2": "2",
    "RestaurantsReservations": "False",
    "RestaurantsGoodForGroups": "True",
    "BusinessAcceptsCreditCards": "True"
},
"categories": "Nightlife, Restaurants, Tapas/Small Plates, Bars, American
(New), Wine Bars, Beer Bar",
"postal_code": "63101",
"review_count": 752
}
```

7.向business表插入一个id是'aaaaaabbbbbbscccccc2023'的商户,其商户信息与id为'5d-fkQteaqO6CSCqS5q4rw'的商户完全一样,插入完成之后,将这个新记录的info中的name键值对删去,最后查询'aaaaaabbbbbbscccccc2023'的所有信息.

business_id	business_info
aaaaaabbbbbbscccccc2023	{ "city": "Santa Barbara", "hours": { "Friday": "9:0-19:0", "Monday": "0:0-0:0", "Tuesday": "9:0-19:0", "Saturday": "9:0-19:0", "Thursday": "9:0-19:0", "Wednesday": "9:0-19:0", "stars": 4.5, "state": "CA", "address": "10 W Calle Laurels, Ste B", "is_open": 1, "latitude": 34.440118, "longitude": -119.728287, "attributes": { "WiFi": "u'free", "BikeParking": "True", "BusinessParking": { "garage": False, "street": True, "validated": False, "lot": False, "valet": False }, "ByAppointmentOnly": "False", "RestaurantsPriceRange2": "2", "BusinessAcceptsCreditCards": "True" }, "categories": "Beauty & Spas, Nail Salons", "postal_code": "93105", "review_count": 49 }

c) .JSON聚合:

8.在business表的所有商户中,按所在州(state)进行聚合,对于每个州返还一个JSON对象,这个对象的每一个键值对中,key是城市,value是城市总共出现的次数,结果按照州名升序排序.

提示:这里需要去掉引号让group by 的key更好一些.

共27行,这里展示前5行

state	city	occ_num
AB	{ "Enoch": 4, "Beaumont": 10, "Downtown": 1, "Edmonton": 2, "Edmonton": 5054, "Sherwood": 1, "St Albert": 93, "St. Albert": 70, "AB Edmonton": 1, "NW Edmonton": 1, "Eaux Claires": 1, "Saint Albert": 22, "Spruce Grove": 1, "East Edmonton": 1, "Sherwood Park": 297, "Staint Albert": 1, "West Edmonton": 3, "Old Strathcona": 1, "Sturgeon Couny": 1, "Fort Saskatchewan": 1, "Southeast Edmonton": 4, "Edmonton City Centre": 1, "Alberta Park Industrial": 1, "Pilot Sound Area West Portion": 1 }	
AZ	{ "Vail": 51, "Maran": 1, "Tuson": 1, "Marana": 102, "Oracle": 2, "TUCSON": 6, "Tucson": 9251, "Tucson": 18, "tucson": 4, "Arizona": 1, "Cortaro": 3, "Rillito": 2, "Catalina": 13, "Sahuarita": 69, "TUCSON AP": 1, "Oro Valley": 286, "Oro valley": 1, "Santa Rita": 1, "Casa Adobes": 1, "Green Valle": 1, "Summerhaven": 1, "Casas Adobes": 4, "Green Valley": 69, "Mount Lemmon": 7, "South Tucson": 3, "Los Ranchitos": 1, "Picture Rocks": 1, "Valencia West": 1, "Drexel Heights": 1, "Tucson, Arizona": 2, "Corona De Tucson": 2, "Corona de Tucson": 3, "Catalina Foothills": 2 }	
CA	{ "Reno": 3, "Eagle": 1, "Tampa": 1, "Goleta": 798, "Oxnard": 1, "Sparks": 1, "Salinas": 1, "Truckee": 11, "Ventura": 1, "Cerritos": 1, "Meridian": 1, "Valencia": 1, "Montecito": 93, "West Hill": 1, "Costa Mesa": 1, "Isla Vista": 94, "Santa Ynez": 1, "Summerland": 41, "Aliso Viejo": 1, "Carpinteria": 299, "Kings Beach": 1, "Los Angeles": 1, "Real Goleta": 1, "Santa Clara": 1, "Santa Maria": 1, "Spring Hill": 1, "Port Hueneme": 1, "Santa Barbra": 2, "SANTA BARBARA": 1, "Santa Barbara": 3835, "santa Barbara": 1, "Mission Canyon": 1, "Santa Barbara": 1, "Santa Barbara,: 1, "SANTA BARBARA AP": 1, "South Lake Tahoe": 1, "Santa Barbara & Ventura Counties": 1 }	
CO	{ "Vail": 1, "Denver": 1, "Dumont": 1 }	
DE	{ "Bear": 5, "Arden": 1, "Aston": 1, "Dover": 1, "Media": 1, "NEWARK": 1, "Newark": 359, "Smyrna": 1, "Elsmere": 5, "Newport": 14, "Stanton": 1, "Yorklyn": 2, "Claymont": 58, "Edgemoor": 1, "Hockessin": 85, "Monchanin": 1, "Newcastle": 1, "Bellefonte": 2, "Christiana": 18, "Glen Mills": 1, "Greenville": 17, "Montchanin": 3, "New Castle": 217, "New castle": 1, "Pike Creek": 2, "Wilmington": 1447, "Winterthur": 1, "wilmington": 1, "Centreville": 1, "Marshallton": 3, "Talleyville": 8, "Wilmington": 1, "Trolley Square": 1, "Wilmington Manor": 3 }	

9.查询user_id是'_1cb6cwl3uAbMTK3xaGbg'的用户的所有朋友的建议,并按用户进行分组聚合,对每一个用户,返还用户的id,用户的名字,由他/她的所有建议构成的字符串数组,最后按名字升序排序输出.

提示:由于user表的friends存的是由id组成的字符串,而不是字符串数组,这里可以使用REGEXP_LIKE()函数进行模式匹配.

共3行

user_id	name	text_array
laqwlTG5Se-kt_MHBOalag	"Elizabeth"	["Great service! So friendly and welcoming. Excellent people. Great beer:"]
N-qPxrzdRaO9xG5VMjn8pA	"Emilie"	["Great service ! The lady was soooo nice and the fish and chips was great !", "Loveeee this place !! Amazing burros and service", "Grasshoppers", "Great service ! Good drinks and food :) would recommend", "Nice place! Good food ! The staff was really nice my mom loves this place"]
s1t-N7hhU-6ThJeQPvUOJQ	"Nacim"	["Two words: just go!!!"]

d) . JSON实用函数的使用:

10.在business表中,分别查询城市在EdMonton和Elsmere的商铺,并使用JSON_OVERLAPS()判断在这两个城市的商铺之间是否在一周中至少有一天营业时间完全重合(即hours对象中至少有一个键值对相同,不考虑键不存在的情况),是返回1,不是返回0.

共10行

name1	city1	name2	city2	hours1	hours2	has_same_opentime
"Browns Socialhouse Manning"	"EdMonton"	"Monro Auto Service And Tire Centers"	"Elsmere"	"Friday": "11:30-22:0", "Monday": "0:0-0:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "7:30-19:0", "Monday": "7:30-19:0", "Sunday": "9:0-17:0", "Tuesday": "7:30-19:0", "Saturday": "7:30-18:0", "Thursday": "7:30-19:0", "Wednesday": "7:30-19:0"	0
"Browns Socialhouse West Henday"	"EdMonton"	"Monro Auto Service And Tire Centers"	"Elsmere"	"Friday": "11:30-22:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "7:30-19:0", "Monday": "7:30-19:0", "Sunday": "9:0-17:0", "Tuesday": "7:30-19:0", "Saturday": "7:30-18:0", "Thursday": "7:30-19:0", "Wednesday": "7:30-19:0"	0
"Browns Socialhouse Manning"	"EdMonton"	"D'Yajaira's Dominican Salon"	"Elsmere"	"Friday": "11:30-22:0", "Monday": "0:0-0:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "9:0-18:0", "Monday": "9:0-18:0", "Tuesday": "9:0-18:0", "Saturday": "8:0-18:0", "Thursday": "9:0-18:0", "Wednesday": "9:0-18:0"	0
"Browns Socialhouse West Henday"	"EdMonton"	"D'Yajaira's Dominican Salon"	"Elsmere"	"Friday": "11:30-22:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "9:0-18:0", "Monday": "9:0-18:0", "Tuesday": "9:0-18:0", "Saturday": "8:0-18:0", "Thursday": "9:0-18:0", "Wednesday": "9:0-18:0"	0
"Browns Socialhouse Manning"	"EdMonton"	"Omka Grill & Sushi"	"Elsmere"	"Friday": "11:30-22:0", "Monday": "0:0-0:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "10:30-22:30", "Monday": "10:30-22:0", "Sunday": "15:0-21:0", "Tuesday": "10:30-22:0", "Saturday": "10:30-22:30", "Thursday": "10:30-22:0", "Wednesday": "10:30-22:0"	0
"Browns Socialhouse West Henday"	"EdMonton"	"Omka Grill & Sushi"	"Elsmere"	"Friday": "11:30-22:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "10:30-22:30", "Monday": "10:30-22:0", "Sunday": "15:0-21:0", "Tuesday": "10:30-22:0", "Saturday": "10:30-22:30", "Thursday": "10:30-22:0", "Wednesday": "10:30-22:0"	0
"Browns Socialhouse Manning"	"EdMonton"	"Dunkin'"	"Elsmere"	"Friday": "11:30-22:0", "Monday": "0:0-0:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "4:30-20:30", "Monday": "4:30-22:30", "Sunday": "5:30-19:0", "Tuesday": "4:30-20:30", "Saturday": "4:30-19:0", "Thursday": "4:30-20:30", "Wednesday": "4:30-20:30"	0
"Browns Socialhouse West Henday"	"EdMonton"	"Dunkin'"	"Elsmere"	"Friday": "11:30-22:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "4:30-20:30", "Monday": "4:30-22:30", "Sunday": "5:30-19:0", "Tuesday": "4:30-20:30", "Saturday": "4:30-19:0", "Thursday": "4:30-20:30", "Wednesday": "4:30-20:30"	0
"Browns Socialhouse Manning"	"EdMonton"	"Dogtopia of Elsmere"	"Elsmere"	"Friday": "11:30-22:0", "Monday": "0:0-0:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "7:0-17:0", "Monday": "0:0-0:0", "Sunday": "10:0-17:0", "Tuesday": "7:0-19:0", "Saturday": "10:0-17:0", "Thursday": "7:0-19:0", "Wednesday": "7:0-19:0"	1
"Browns Socialhouse West Henday"	"EdMonton"	"Dogtopia of Elsmere"	"Elsmere"	"Friday": "11:30-22:0", "Sunday": "11:30-20:0", "Tuesday": "11:30-20:0", "Saturday": "11:30-22:0", "Thursday": "11:30-20:0", "Wednesday": "11:30-20:0"	"Friday": "7:0-17:0", "Monday": "0:0-0:0", "Sunday": "10:0-17:0", "Tuesday": "7:0-19:0", "Saturday": "10:0-17:0", "Thursday": "7:0-19:0", "Wednesday": "7:0-19:0"	0

11.在user表中,查询funny大于2000且平均评分大于4.0的用户,返回他们的名字,平均评分,以及按json数组形式表示的funny, useful, cool,三者的和,限制10条;尝试按平均评分降序排序,并使用explain查看排序的开销,与第一题的排序情况做对比,主要关注"rows_examined_per_scan"和"cost_info".

name	avg_stars	[funny,useful,cool,sum]
"Billy Joe"	4.17	[3504, 5172, 4341, 13017.0]
"Will"	4.1	[7950, 13933, 12679, 34562.0]
"Paige"	4.07	[34865, 80394, 78116, 193375.0]
"Melody"	4.04	[2393, 4254, 3734, 10381.0]
"Yuri"	4.08	[4537, 6404, 5610, 16551.0]
"Lorri"	4.16	[6000, 8374, 7030, 21404.0]
"Trina"	4.02	[18009, 25642, 22986, 66637.0]
"Nicole"	4.38	[2257, 3984, 3139, 9380.0]
"Karey"	4.04	[3437, 4182, 3634, 11253.0]
"Harald"	4.18	[173096, 205765, 199878, 578739.0]

12.在tip表中找到被提建议最多的商户和提出建议最多的用户,合并二者的info列的JSON文档为一个文档显示,对于JSON文档中相同的key值,应该保留二者的value值.

结果一行一列,用JSON_PRETTY()展示如下

```
{
  "city": "New Orleans",
  "cool": 479,
  "fans": 246,
  "name": [
    "Michael",
    "Café Du Monde"
  ],
  "elite": "2016",
  "funny": 369,
  "hours": {
    "Friday": "8:0-20:0",
    "Monday": "8:0-20:0",
    "Sunday": "8:0-20:0",
    "Tuesday": "8:0-20:0",
    "Saturday": "8:0-20:0",
    "Thursday": "8:0-20:0",
    "Wednesday": "8:0-20:0"
  },
  "stars": 4.0,
  "state": "LA",
  "useful": 1191,
  "address": "800 Decatur St",
```


"friends": "i8zm72KrM_2A9gsbbOvUXA, NCjQXZnTwxsLYZR-12uUzw, D8UGNPLY2z9b8QD7-5GN1g, URPUZR0LWdIW7c9uMmJJEW, vbEf26yXYP0WBSveEXWi1w, QqMeCZMhTFbvz7Em1Jfq5Q, e5E4o1ionoXrdtUNe1xxsg, GcdYgbaF75vj7R06EZhpOQ, VUh3UiuyGOp2SjA0qrmYaA, THJo4sOXGm4jxA9UuocJag, zXLn1jPx2Dhbs1vsf84cAg, FDRqRD8jgKLrNIhS3tzfbQ, iohuxUSTvgb48a_hcqJiSw, XD_SGGnLRR-NmdI_jjobZg, OFj6KTUZQaAi-1lVJ10x1A, bwq4VuSXz4Xx1P9CPQIwCg, eg0cwrodeKGLeIDTSCXoA, imGQirCh-t_Kftb4U7VuUA, VC1MTiHXY1LNja1D3N4XQ, 1u9v6r4bo6nh1i5z4Z-BDg, eJnwyot0rLyWN84Dwyc0RA, dGni31SiD0DnpG2RHG8qDQ, zOg0WEW2adv_vwuYt1LHOW, 2-emZYMEFFSOCEBF6B-0NQ, IIB_s9SiBctUf8gXeFKKUQ, _hPjqzQDiyw1-4U_IAETpg, 1pnI226_ekGGvKx2Kd-biQ, 3QnoTcrxuafMCotZW_AH7A, HBLDsdGpWd13cnu6hoeR5w, LVOEoKvGvZtkCVSsxSRPJw, BoGR-M9vtU-NpwkhcxYdwQ, UsZGD3uzMxwv0K1vs89fww, 7RuSAC-Ms1k4aizXXJpQTg, XxG5SZOPkihweJe3r9XL8Q, aaEr2-3Qaa4jo9rkjiqibA, B9iPTih0dmpZn6fryZnLLg, EC94DcVFXZerK86puyINzg, RTZkjxg0Hjg1pBUB1w6EpQ, Sf3LGHUShr5ZocB5b2TdNa, z9sL9d4kFAiQeGJ1dGmBng, UYU71DRx-UDAee-eFOFfww, SsVBQUfFWR6kyaoXMXvU3g, B2TziZD_Ss6FsQOKUVCRMA, Oilqbcz2m2SnwUeztGYcnQ, M9f1_TmxxKyaGfLN3kAvbA, mIM2MksPdKXSDOegsf5ZXA, xgcbjCjVhvsf6zgw9DuUkw, OLGQ7a1K4VK13YdQk6UF5g, 61FNJUIdQXReviksoYiILQ, aRIwtrfgPx4Acdfc_9Uh4w, 2AkZF9Xoqwwop1k55icKMq, R7oqm48ww0h0n2veJodJ1w, mzXDuhZBPdHfMIk1YXP0mQ, zu8gMXVFPdQsKLZssXaBqw, pUNvLJwdJIOemOgu98mp1w, VRkv17cgz3qDw_6XbqwyIg, a-8ZuiQk4EswgebrG-K2HQ, S_qq4WijgaxgmDc1opDXvw, 9WEZMCmuxjzbtie5dZtAw, fAJ4v8Wkt7DYkC2dskayvQ, 1k36zEvbfj3HEHENqCLAUG, PV0U0arT_AufjvBtrkFpSA, rvYTWj_twMGMkt3k7qjxZQ, pamPk2N-Or1mJry_CfJN5Q, _BcwyKQL16ndpBdggh2kNA, uw9cwb4qvH0EKvUH-X_W-w, e3L8Wxi1t481HuEk6yo8YA, fa8Nww6_UjyvMWPg90C1yA, S1-cbVcxw7Psw1GG11H-xg, n0iFO9S6ZvOBh15pLeMwMw, 3JPR1B0s4Hby45Y0KZcEWg, 8tG-VocqZctOrhmgGIhStg, 6IYtyaGT1wxBNOD0bgwggA, pNCdtTy_qwIbx3DZAV3VBQ, hVPyu7QwasQg01z0rppmkG, 41XKBeEe22TtKSUVB2V61w, H2uGBjLQH5s_bRRYMzEG9Q, _vgG4XF8NCZBmZzP-5CTLQ, mzL0zHFGyd98660U1jq49g, Mf_Phi8Xwn8I5w9r15-uyQ, qZDo731eTHicM8Zob4nRRw, cndpw40Qv2txy9Ek61u7hQ, QD9xhB-261YIQIFI5sRBtQ, S59QzY7MKj6MHedX6gTaHw, q-765B30dfZ6L6EE1B3m6Q, 6dBQjonr0qy81gXY-Yw7hw, tu1XdABnHGNVnguwxZ_HA, 1N_sKvrVdQA_N58IhpSEyQ, swVZCCvWB_nquY-FibuFdA, dYJPA1kQx_K7wvfbg3aj7A, Azv31K5dNqPTJzPRnPTEsQ, pppIHoa8b8B8wd5t72sDxA, GG0mFsEXb-02_dzFPqRV1Q, 2iMiB_CHjw0ACHwmIEV3cA, 9Ffa26SH-_tyAzfZ7vVbLA, 3gHC7VtTif8omNP00Djp6w, uPr3t2M-Oyka8M_oro7j1A, iExzs4voEa1-N0bSYODg1A, ouODopBKF3AqfCkuQEnrDg, 27M0B4ENG7sI-Z2gCuqANA, AeiwVofJT08y0OXwqo1tzw, B9N1FI4hwYPV4yrCpCsx1w, 1_RuhFJX555w1h4CD7ssmA, SGPCLi-kVz_pz1w7VjtkeA, wvutaEoxM-8ME0JFTTWBDg, KF9W9AfHK19MzKgJKN2Yvw, ixtKgePFibGvpyMrPogstg, AGnoMbaIUawiGzq4J2krDw, OExmdhEdCKHQqXrv6ftTg, RCXX_k3R2Zf1kzmTpopWA, AvGJVv7Z3a0q1MJT1Ykd0w, uUF5VVF4eLGG1ToTnoBSBw, rFANUt3nNW1auqQTILUGQ, aKN4aQnnIw3ePdZexv8a2g, gv0conUFY-fibRwP8IKqPA, 1oAMMKGXoztOWDI0QzXJQQ, RKULSorIvvYpDmtuYXEXZA, Am_G2m0pwVrEg9AoUp5tow, KR1U43dwVKdfkZesYBJUA, jhvreoViehq5zA4p2dgSVg, 5GLB61xLOP6T-pNsr7rs1g, Z6zAW5KYUbOq1v1pa63STw, 4d17x1_fGoPInC4eMSzRFQ, 1MwoiUajN2154d4K9uTycA, to5LTCBrkhyBwsIHkrjttQ, n1OrzdUyWZxcvrRa7bfQag, w0Eb3PnZFiyQdwqXYKnx3A, dfMqoJD3kHmry1KAUVkOMQ, UK1wgb1Pu3hx1qohVRA4mQ, S_h68w1GSdGvokLxvLCmjg, zu-e06_BM_TdkaZEKMriww, bJ5FtCtZX3ZZacz2_2PjJA, ixyBIconCZ9KZgorVuPl8g, R95jUAYcnhesh9L5kCSeSA, 1bjo-xG3tkF5rjRx5zw4Q, u9qhYrSC-AVPXgvrLHeQZw, NMOxipSnxc6olWdHYzXiYA, FlXBpK_YZxLo27jcmDI1w, w6OPX0bAyXIFKwkGDJrtGA, 5DFAq-cfv88eZEW-6Nm89A, qEsx3c9NOITacXqTqjBOCQ, LdEYNIyrZjPeIcdG7A_YSQ, ZCVEZmTB-StK-UXA3WPV1Q, SPuzzZ0VZ1yyb3s9obLnaw, y7H-4bwuX3eqC7C11DvQCA, TtuLYyy4Gf41XA2JUQgY8A, 8EMU7d4pCkdqUnv1IW40CA, 16yfdXvoj6ra0hqFjLu2cQ, BmVwbsL810imz4slonyMaA, KLrTBLpN4cSEWkdLX2meYQ, BTHXLOCKyo1z8Zrwq8-9_g, ko30XR2WeF6b1a6dK1ZZLw, nxNO7_6U2Nu90v0IdnEhIg, ayVeEctPYCziubXyEgLhTA, ow-Xzd5e8gMmHG4Du5SBQA, nkBpODDjnP-nd9uz1Z4YsA, f_1bRw8RuK-zZAKuUMTqNw, jL1TI1E0Yc0y-yQKCh307A, REFGsoLynoBWxdTEJexYfw, NGGD_11d2RXR8wTurenLgg, Ch759-9JBBu-UafQ2-abyQ, ryist19-tzvmyvVi0iLvwA, 1RRuTimITgwzoXLM3g9qw, ePxjx8tee06mn5h87X-Sxg, bh3yc4ZI4CGD_wpPzKML5A, toTPlIk838ZR1w1huTdx_Q, JwpGFZIF5782bwOPgyrZzw, 1k_wG1zRHkoHER2zp3chW, EfDjFcZzrvUI9v-bi0gv2w, CAU7F-vDqbQZ67BBysa-aA, Xuaq1mZdr1dcw97I-TtX9w, 1eDIDqF88uxUU5DPY90PSg, wnrHhjDpQk5uLUK7Iku75A, xOr3cP1xO2qC41x2E9jnBg,

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  "compliment_list": 1,
  "compliment_more": 32,
  "compliment_note": 616,
  "compliment_funny": 568,
  "compliment_plain": 1561,
  "compliment_photos": 305,
  "compliment_writer": 33,
  "compliment_profile": 12
}

```

13.查询被评论数前三的商户,使用JSON_TABLE()导出他们的名字,被评论数,是否在星期二营业(即"hours"中有"Tuesday"的键值对,是返回1,不是返回0),和一周所有的营业时段(不考虑顺序,一个时段就对应一行,对每个商户,从1开始对这些时段递增编号),最后按商户名字升序排序.

共19行

business_name	business_review_count	business_open_on_Tuesday	num	hours_in_a_week
Acme Oyster House	7568	0	1	11:0-22:0
Acme Oyster House	7568	0	2	11:0-22:0
Acme Oyster House	7568	0	3	11:0-22:0
Acme Oyster House	7568	0	4	11:0-22:0
Acme Oyster House	7568	0	5	11:0-22:0
Hattie B' s Hot Chicken - Nashville	6093	1	1	11:0-0:0
Hattie B' s Hot Chicken - Nashville	6093	1	2	0:0-0:0
Hattie B' s Hot Chicken - Nashville	6093	1	3	11:0-16:0
Hattie B' s Hot Chicken - Nashville	6093	1	4	11:0-16:0
Hattie B' s Hot Chicken - Nashville	6093	1	5	11:0-0:0
Hattie B' s Hot Chicken - Nashville	6093	1	6	11:0-22:0
Hattie B' s Hot Chicken - Nashville	6093	1	7	11:0-22:0
Oceana Grill	7400	1	1	8:0-1:0
Oceana Grill	7400	1	2	8:0-1:0
Oceana Grill	7400	1	3	8:0-1:0
Oceana Grill	7400	1	4	8:0-1:0
Oceana Grill	7400	1	5	8:0-1:0
Oceana Grill	7400	1	6	8:0-1:0
Oceana Grill	7400	1	7	8:0-1:0

任务2：MongoDB

a) . MongoDB条件查询与执行计划:

1.查询review集合的2条数据，跳过前6条。

共2条记录//skip、limit

```
{
  "_id": {
    "$oid": "600d7ea4f5e9bd91d7c3001e"
  },
  "review_id": "G7XHMxG0bx9oBJNECG4IFg",
  "user_id": "jlu4CztcsXrKx56ba1a5AQ",
  "business_id": "3fw2X5bZYew9xCz_zGhOHg",
  "stars": 3,
  "useful": 5,
  "funny": 4,
  "cool": 5,
  "text": "Tracy dessert had a big name in Hong Kong and the one in First Markham place has been here for many years now! \n\nCame in for some Chinese dessert, and I must say their selection has increased tremendously over the years. I might as well add that the price has also increased tremendously as well. The waitress gave us tea, which I could taste had red date in it. Fancy!\n\nA simple taro with coconut with tapioca pearls was like $5.25 or something. Basically all the desserts were more than $5. That's crazy! I can literally just make this dessert at home and for a bowl, it would probably cost like $0.50. A few years ago, I think I can still get it for like $3-$4, which is more reasonable, but wow, more than $5 is a little over the top for this dessert. Though I must say, it is Tracy Dessert, and they are a little more on the expensive side. \n\nI also saw other items on the menu like fish balls, chicken wings, shaved ice. My friend got a mango drink with fresh mango in it! \n\nI'm also surprised how many people come to Tracy Dessert after work. We came on a Sunday and the tables were always filled. I think the amount of tables they had were just perfect because no one really waited for seats for a long time, but the tables kept filling up once a table was finished.",
  "date": "2016-05-07 01:21:02"
}
{
  "_id": {
    "$oid": "600d7ea4f5e9bd91d7c3001f"
  },
  "review_id": "8e9HxxLjjqc9ez5ezzN7iQ",
  "user_id": "d6xvYpyzcfbF_AZ8vMB7QA",
  "business_id": "zvO-PJCpnk4fgAVUnEXYAA",
  "stars": 1,
  "useful": 3,
  "funny": 1,
  "cool": 1,
  "text": "This place has gone down hill. Clearly they have cut back on staff and food quality\n\nMany of the reviews were written before the menu changed. I've been going for years and the food quality has gone down hill.\n\nThe service is slow & my salad, which was $15, was as bad as it gets.\n\nIt's just not worth spending the money on this place when there are so many other options.",
  "date": "2010-10-05 19:12:35"
}
```


2.查询business集合中city是Las Vegas的5条数据。

共5条记录 //简单条件查询

```
[{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183c8"
  },
  "business_id": "gbQN7vr_caG_AlugSmGhwg",
  "name": "Supercuts",
  "address": "4545 E Tropicana Rd Ste 8, Tropicana",
  "city": "Las Vegas",
  "state": "NV",
  "postal_code": "89121",
  "latitude": 36.099872,
  "longitude": -115.074574,
  "stars": 3.5,
  "review_count": 3,
  "is_open": 1,
  "attributes": {
    "RestaurantsPriceRange2": "3",
    "GoodForKids": "True",
    "BusinessAcceptsCreditCards": "True",
    "ByAppointmentOnly": "False",
    "BikeParking": "False"
  },
  "categories": [
    "Hair Salons",
    "Hair Stylists",
    "Barbers",
    "Men's Hair Salons",
    "Cosmetics & Beauty Supply",
    "Shopping",
    "Beauty & Spas"
  ],
  "hours": {
    "Monday": "10:0-19:0",
    "Tuesday": "10:0-19:0",
    "Wednesday": "10:0-19:0",
    "Thursday": "10:0-19:0",
    "Friday": "10:0-19:0",
    "Saturday": "10:0-19:0",
    "Sunday": "10:0-18:0"
  },
  "loc": {
    "type": "Point",
    "coordinates": [
      -115.074574,
      36.099872
    ]
  }
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d2"
  },
  "business_id": "PZ-LZzs7hse9utkQYU8pFg",
```



```
"name": "Carluccio's Tivoli Gardens",
"address": "1775 E Tropicana Ave, Ste 29",
"city": "Las Vegas",
"state": "NV",
"postal_code": "89119",
"latitude": 36.1000163,
"longitude": -115.1285285,
"stars": 4,
"review_count": 40,
"is_open": 0,
"attributes": {
  "OutdoorSeating": "False",
  "BusinessAcceptsCreditCards": "True",
  "RestaurantsDelivery": "False",
  "RestaurantsReservations": "True",
  "RestaurantsAttire": "'casual'",
  "Ambience": "{'romantic': True, 'intimate': False, 'touristy': False,
'hipster': False, 'divey': False, 'classy': True, 'trendy': False, 'upscale':
False, 'casual': False}",
  "HasTV": "False",
  "BYOBCorkage": "'no'",
  "NoiseLevel": "u'quiet'",
  "RestaurantsTakeOut": "True",
  "RestaurantsPriceRange2": "2",
  "RestaurantsGoodForGroups": "True",
  "WiFi": "u'no'",
  "Caters": "True",
  "GoodForKids": "True",
  "Alcohol": "u'full_bar'",
  "BusinessParking": "{'garage': False, 'street': False, 'validated': False,
'lot': True, 'valet': False}"
},
"categories": [
  "Restaurants",
  "Italian"
],
"hours": null,
"loc": {
  "type": "Point",
  "coordinates": [
    -115.1285285,
    36.1000163
  ]
}
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d3"
  },
  "business_id": "nh_kQ16QAoxWwqZ05MPfBQ",
  "name": "Myron Hensel Photography",
  "address": "",
  "city": "Las Vegas",
  "state": "NV",
  "postal_code": "89121",
  "latitude": 36.1165487,
  "longitude": -115.0881146,
  "stars": 5,
```

```

"review_count": 21,
"is_open": 1,
"attributes": {
  "BusinessAcceptsCreditCards": "True"
},
"categories": [
  "Event Planning & Services",
  "Photographers",
  "Professional Services"
],
"hours": {
  "Monday": "0:0-0:0",
  "Tuesday": "0:0-0:0",
  "Wednesday": "0:0-0:0",
  "Thursday": "0:0-0:0",
  "Friday": "0:0-0:0",
  "Saturday": "0:0-0:0",
  "Sunday": "0:0-0:0"
},
"loc": {
  "type": "Point",
  "coordinates": [
    -115.0881146,
    36.1165487
  ]
}
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d5"
  },
  "business_id": "dFMxzHygTy6F873843dHAA",
  "name": "Fremont Arcade",
  "address": "450 Fremont St, Ste 179",
  "city": "Las Vegas",
  "state": "NV",
  "postal_code": "89101",
  "latitude": 36.169993,
  "longitude": -115.140685,
  "stars": 4.5,
  "review_count": 38,
  "is_open": 1,
  "attributes": {
    "GoodForKids": "True"
  },
  "categories": [
    "Arcades",
    "Arts & Entertainment"
  ],
  "hours": {
    "Monday": "11:0-0:0",
    "Tuesday": "11:0-0:0",
    "Wednesday": "11:0-0:0",
    "Thursday": "11:0-0:0",
    "Friday": "11:0-1:0",
    "Saturday": "11:0-1:0",
    "Sunday": "11:0-0:0"
  },

```

```
"loc": {
  "type": "Point",
  "coordinates": [
    -115.140685,
    36.169993
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d7"
  },
  "business_id": "Kwywu2tTEPWmR9JnBC0WyQ",
  "name": "Hunk Mansion",
  "address": "6007 Dean Martin Dr",
  "city": "Las Vegas",
  "state": "NV",
  "postal_code": "89118",
  "latitude": 36.0801679,
  "longitude": -115.1827558,
  "stars": 4,
  "review_count": 107,
  "is_open": 1,
  "attributes": {
    "BikeParking": "False",
    "Ambience": "{ 'romantic': False, 'intimate': True, 'classy': False,
'hipster': False, 'divey': False, 'touristy': False, 'trendy': False, 'upscale':
False, 'casual': False}",
    "RestaurantsPriceRange2": "2",
    "HasTV": "True",
    "Music": "{ 'dj': True, 'background_music': False, 'no_music': False,
'jukebox': False, 'live': False, 'video': False, 'karaoke': False}",
    "RestaurantsGoodForGroups": "True",
    "OutdoorSeating": "True",
    "RestaurantsReservations": "True",
    "BusinessParking": "{ 'garage': False, 'street': False, 'validated': False,
'lot': True, 'valet': True}",
    "GoodForKids": "False",
    "Alcohol": "u'full_bar'",
    "NoiseLevel": "'loud'",
    "BusinessAcceptsCreditCards": "True",
    "GoodForDancing": "True"
  },
  "categories": [
    "Nightlife",
    "Arts & Entertainment",
    "Bars",
    "Strip Clubs",
    "Adult Entertainment",
    "Dance Clubs"
  ],
  "hours": {
    "Thursday": "19:30-2:0",
    "Friday": "19:30-3:0",
    "Saturday": "19:30-3:0",
    "Sunday": "19:30-2:0"
  },
  "loc": {
```

```
    "type": "Point",
    "coordinates": [
      -115.1827558,
      36.0801679
    ]
  }
}]
```

3.查询user集合中name是Steve的user，只需要返回useful和cool,限制10条数据。

共10条记录//简单条件查询，返回指定列

```
[{
  "_id": {
    "$oid": "600d35c72cb85d6290190f0c"
  },
  "useful": 680,
  "cool": 383
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901911d1"
  },
  "useful": 33,
  "cool": 10
},
{
  "_id": {
    "$oid": "600d35c72cb85d629019141f"
  },
  "useful": 4359,
  "cool": 3663
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901914b4"
  },
  "useful": 4,
  "cool": 2
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191803"
  },
  "useful": 31343,
  "cool": 28316
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191a86"
  },
  "useful": 2,
  "cool": 2
},
{
  "_id": {
```

```

    "$oid": "600d35c72cb85d6290191ad0"
  },
  "useful": 9,
  "cool": 0
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191b18"
  },
  "useful": 709,
  "cool": 339
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191b88"
  },
  "useful": 295,
  "cool": 115
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191bb0"
  },
  "useful": 41,
  "cool": 8
}
}]

```

4.查询user集合中funny位于[66, 67, 68]的user，只需返回name和funny，限制20条数据。

//条件查询in使用，返回指定列

```

[ {
  "_id": {
    "$oid": "600d35c72cb85d62901910ac"
  },
  "name": "Aileen",
  "funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d629019119c"
  },
  "name": "Alison",
  "funny": 67
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901911b6"
  },
  "name": "Karin",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191290"
  },

```

```
"name": "Ashlee",
"funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901913ea"
  },
  "name": "Angie",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901914b6"
  },
  "name": "Kristen",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191840"
  },
  "name": "Kathleen",
  "funny": 67
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901918f3"
  },
  "name": "Ted",
  "funny": 67
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191907"
  },
  "name": "Donald",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191911"
  },
  "name": "Heidi",
  "funny": 67
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191953"
  },
  "name": "Angelica",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d62901919da"
  },
  "name": "Julia",
  "funny": 68
}
```



```
,
{
  "_id": {
    "$oid": "600d35c72cb85d6290191a2e"
  },
  "name": "Melinda",
  "funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191b03"
  },
  "name": "Lisa",
  "funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191b45"
  },
  "name": "Sofia",
  "funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191bbd"
  },
  "name": "Amy",
  "funny": 68
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191c77"
  },
  "name": "Keane",
  "funny": 67
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191ce2"
  },
  "name": "Karina",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d6290191f29"
  },
  "name": "Jess",
  "funny": 66
},
{
  "_id": {
    "$oid": "600d35c72cb85d629019203d"
  },
  "name": "Linda",
  "funny": 68
}]
```

5.查询user集合中 $15 \leq cool < 20$ 且 $useful \geq 50$ 的user，限制10条。

这里只展示前两条 //多条件查询

```
{
  "_id": {
    "$oid": "600d35c72cb85d6290190ec1"
  },
  "user_id": "AFKRid_wmgxyCKpnX4G30Q",
  "name": "Vande",
  "review_count": 89,
  "yelping_since": "2008-06-17 19:52:32",
  "useful": 156,
  "funny": 35,
  "cool": 18,
  "elite": "",
  "friends": [
    "-o255H8X2emZdRoxO_hwkW",
    "1GmW7J8njTr2aBdFoZnV4Q",
    "-JZapGfZMAefaa3U1ziARg",
    "No4sKxb2J2c7507hfdT8vw",
    "L8d61tDHFb5CemHBuvxn-g",
    "DGKGDP0i9yX_CClrLs1gBg",
    "jvny8UW9uCSut3R0AGErog",
    "-fpDCR3Ppji9V4XB_PCQGg",
    "MMvVvk9qo00Y8wxMbaQu1Fg",
    "HU-maHDJDJmOGYtNg93m9g",
    "qpPnK7T2T2QHaider0HXgg",
    "f6OwAD4gNi3Ed7Qfs57jRw",
    "gRAQk69dLRJs5SjIH3mnAA",
    "Pc8a3ugZDkm8TyG8YiT09g",
    "LARQ1li6_juzNEduz3Ze2w",
    "petryivGeV4NgZZUxscYSA",
    "jcuD8T1N_6XqArgiStPz3g",
    "HfEAp9wt2HE4gt1Hx6-L7Q",
    "Un0xsvk9o33VAwL0BMut9g",
    "SBBDYghIdbucTIRkpwbZDg",
    "w79MCW55IIT9MB8j-kLm1w",
    "qNjYwcxy95eRMyy82aHwOw",
    "bawupd_8SjxKLyIUscKJOQ",
    "d3gkFDJacne-q_PNLBHZ1g",
    "bpvYtoae7p9De_qSupD2uQ"
  ],
  "fans": 1,
  "average_stars": 3.39,
  "compliment_hot": 0,
  "compliment_more": 0,
  "compliment_profile": 0,
  "compliment_cute": 0,
  "compliment_list": 0,
  "compliment_note": 4,
  "compliment_plain": 3,
  "compliment_cool": 0,
  "compliment_funny": 0,
  "compliment_writer": 0,
  "compliment_photos": 0
}
```

```

{
  "_id": {
    "$oid": "600d35c72cb85d6290190ed0"
  },
  "user_id": "qk4VPfpk04tFkvjsgEIXmA",
  "name": "Teresa",
  "review_count": 60,
  "yelping_since": "2010-07-06 23:38:32",
  "useful": 69,
  "funny": 20,
  "cool": 18,
  "elite": "",
  "friends": [
    "R9Ntm9yLvVdy62C6oxcuDg",
    "nwUms1QzNzg80DyZ5LfzjA",
    "sQzFarpH-MRTdAv5BMkzig",
    "Hms17rzNlKVvbms1j6G0Sg",
    "SV4CTK0TJKCybsEXTPVVTQ",
    "Rcxb65dtZZlk-HjBaP5DKw",
    "y3WMCjffm6tJayZit6xpEg",
    "vjy89Svv0m2gAJ2eZcICog",
    "Hkf5v1B2NTmOrE3ErnhRhQ",
    "Sw_13iM3c9A9DeuxlB_PAA",
    "9b7zJ0opAxhqdqMKTAmgOA",
    "xksAzHeCUN0Sz77_rWMObg"
  ],
  "fans": 0,
  "average_stars": 3.41,
  "compliment_hot": 0,
  "compliment_more": 1,
  "compliment_profile": 0,
  "compliment_cute": 0,
  "compliment_list": 0,
  "compliment_note": 1,
  "compliment_plain": 2,
  "compliment_cool": 0,
  "compliment_funny": 0,
  "compliment_writer": 0,
  "compliment_photos": 0
}

```

6.统计business一共有多少条数据，并使用explain查询执行计划，了解MongoDB对集函数的执行方式。

输出结果：192609

对于这个执行计划，应该关注以下关键字：

stage, totalDocsExamined, totalKeysExamined, nCounted, executionTimeMillis, nReturned, namespace

7.查询business集合city为Westlake或者Calgary的数据。

共8125条记录,此处展示前5条 //or查询

```

{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183c7"
  },

```

```
"business_id": "5JucpCFHZltJh5r1JabjDg",
"name": "Edgeworxx Studio",
"address": "20 Douglas Woods Drive Southeast",
"city": "Calgary",
"state": "AB",
"postal_code": "T2Z 1K4",
"latitude": 50.9436456,
"longitude": -114.0018283,
"stars": 3.5,
"review_count": 7,
"is_open": 1,
"attributes": {
  "RestaurantsPriceRange2": "2",
  "BusinessParking": '{"garage': False, 'street': False, 'validated': False,
'lot': True, 'valet': False}",
  "ByAppointmentOnly": "True"
},
"categories": [
  "Beauty & Spas",
  "Hair salons"
],
"hours": null,
"loc": {
  "type": "Point",
  "coordinates": [
    -114.0018283,
    50.9436456
  ]
}
}
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183cb"
  },
  "business_id": "fcXOEZdXYeZqnQ3lG1oxmg",
  "name": "Nucleus Information Service",
  "address": "1210 8th Street SW, Unit 220",
  "city": "Calgary",
  "state": "AB",
  "postal_code": "T2R 1L3",
  "latitude": 51.041771,
  "longitude": -114.081109,
  "stars": 2,
  "review_count": 5,
  "is_open": 1,
  "attributes": {
    "BikeParking": "False",
    "ByAppointmentOnly": "False",
    "BusinessParking": '{"garage': False, 'street': True, 'validated': False,
'lot': False, 'valet': False}",
    "RestaurantsPriceRange2": "1"
  },
  "categories": [
    "Local Services",
    "Professional Services",
    "Computers",
    "Shopping",
    "Home Services",
```

```

        "IT Services & Computer Repair",
        "Internet Service Providers",
        "Web Design"
    ],
    "hours": {
        "Monday": "9:0-17:0",
        "Tuesday": "9:0-17:0",
        "Wednesday": "9:0-17:0",
        "Thursday": "9:0-17:0",
        "Friday": "9:0-17:0"
    },
    "loc": {
        "type": "Point",
        "coordinates": [
            -114.081109,
            51.041771
        ]
    }
}
{
    "_id": {
        "$oid": "6016c6b4af81085b0f2183e9"
    },
    "business_id": "-MsRvdPnuw6QuLn5Vxjruw",
    "name": "Brian's Furniture",
    "address": "30808 Center Ridge Rd",
    "city": "Westlake",
    "state": "OH",
    "postal_code": "44145",
    "latitude": 41.4227938,
    "longitude": -81.9622151,
    "stars": 5,
    "review_count": 3,
    "is_open": 1,
    "attributes": null,
    "categories": [
        "Shopping",
        "Home Services",
        "Interior Design",
        "Rugs",
        "Furniture Stores",
        "Home & Garden",
        "Home Decor",
        "Mattresses"
    ],
    "hours": {
        "Monday": "11:0-20:0",
        "Tuesday": "10:0-20:0",
        "Wednesday": "10:0-20:0",
        "Thursday": "10:0-18:0",
        "Friday": "10:0-18:0",
        "Saturday": "11:0-18:0",
        "Sunday": "0:0-17:0"
    },
    "loc": {
        "type": "Point",
        "coordinates": [
            -81.9622151,

```

```

    41.4227938
  ]
}
}
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183ee"
  },
  "business_id": "e_EMySqP0uw1vZfd8mRaaQ",
  "name": "Pearl Garden",
  "address": "2825 32 Avenue NE",
  "city": "Calgary",
  "state": "AB",
  "postal_code": "T1Y",
  "latitude": 51.0811622,
  "longitude": -113.9934738,
  "stars": 2,
  "review_count": 4,
  "is_open": 0,
  "attributes": {
    "BusinessParking": '{"garage': False, 'street': False, 'validated': False, 'lot': False, 'valet': False}",
    "RestaurantsGoodForGroups": "True",
    "OutdoorSeating": "False",
    "RestaurantsPriceRange2": "1",
    "GoodForKids": "True",
    "RestaurantsDelivery": "False",
    "RestaurantsTakeOut": "True",
    "RestaurantsAttire": "u'casual'"
  },
  "categories": [
    "Chinese",
    "Dim Sum",
    "Restaurants"
  ],
  "hours": null,
  "loc": {
    "type": "Point",
    "coordinates": [
      -113.9934738,
      51.0811622
    ]
  }
}
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183f1"
  },
  "business_id": "jff5hTK1ZMLKS06sOSNwda",
  "name": "Radisson Hotel & Conference Centre Calgary Airport",
  "address": "6620 36 Street NE",
  "city": "Calgary",
  "state": "AB",
  "postal_code": "T3J 4C8",
  "latitude": 51.1118915249,
  "longitude": -113.9804801532,
  "stars": 3.5,
  "review_count": 14,

```



```

"is_open": 1,
"attributes": {
  "RestaurantsPriceRange2": "2",
  "WiFi": "'free'"
},
"categories": [
  "Hotels & Travel",
  "Hotels",
  "Event Planning & Services"
],
"hours": null,
"loc": {
  "type": "Point",
  "coordinates": [
    -113.9804801532,
    51.1118915249
  ]
}
}

```

8.查询business集合中，类别为6种的商户信息，显示这6种类别，限制10条。

```

[ {
  "_id": {
    "$oid": "6016c6b4af81085b0f2183cc"
  },
  "categories": [
    "Restaurants",
    "Breakfast & Brunch",
    "Mexican",
    "Tacos",
    "Tex-Mex",
    "Fast Food"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183cd"
  },
  "categories": [
    "Bars",
    "Nightlife",
    "Pubs",
    "Barbers",
    "Beauty & Spas",
    "Irish Pub"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d4"
  },
  "categories": [
    "Trainers",
    "Health & Medical",
    "Active Life",
    "Physical Therapy",

```

```
    "Gyms",
    "Fitness & Instruction"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183d7"
  },
  "categories": [
    "Nightlife",
    "Arts & Entertainment",
    "Bars",
    "Strip Clubs",
    "Adult Entertainment",
    "Dance Clubs"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183da"
  },
  "categories": [
    "Mexican",
    "Restaurants",
    "Patisserie/Cake Shop",
    "Food",
    "Bars",
    "Nightlife"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183e8"
  },
  "categories": [
    "Auto Glass Services",
    "Auto Detailing",
    "Automotive",
    "Auto Parts & Supplies",
    "Auto Customization",
    "Vehicle Wraps"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f2183f3"
  },
  "categories": [
    "Restaurants",
    "Breakfast & Brunch",
    "Bars",
    "Modern European",
    "Nightlife",
    "Wine Bars"
  ]
},
{
  "_id": {
```

```

    "$oid": "6016c6b4af81085b0f218400"
  },
  "categories": [
    "Men's Clothing",
    "Sporting Goods",
    "Shopping",
    "Fashion",
    "Women's Clothing",
    "Sports wear"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f218403"
  },
  "categories": [
    "Nightlife",
    "Bars",
    "Polish",
    "Modern European",
    "Restaurants",
    "Vegan"
  ]
},
{
  "_id": {
    "$oid": "6016c6b4af81085b0f218411"
  },
  "categories": [
    "Nightlife",
    "Italian",
    "Restaurants",
    "Japanese",
    "Lounges",
    "Bars"
  ]
}
}]

```

9.使用explain看 db.business.find({business_id: "5JucpCfHZl7tJh5r1JabjDg"}) 的执行计划，了解该查询的执行计划及查询执行时间，并给出物理优化手段，以提高查询性能，通过优化前后的性能对比展现优化程度。

提示：建立索引，对比建立前后的性能

执行计划应关注 "stage" : "COLLSCAN"、parsedQuery、winningPlan、rejectedPlans 关键词

b). 聚合与索引:

10.统计各个星级的商店的个数，返回星级数和商家总数，按照星级降序排列。

共9条记录

```
{ "cnt" : 28216, "stars" : 5 }
{ "cnt" : 27301, "stars" : 4.5 }
{ "cnt" : 35969, "stars" : 4 }
{ "cnt" : 35008, "stars" : 3.5 }
{ "cnt" : 25996, "stars" : 3 }
{ "cnt" : 18843, "stars" : 2.5 }
{ "cnt" : 11426, "stars" : 2 }
{ "cnt" : 4976, "stars" : 1.5 }
{ "cnt" : 4874, "stars" : 1 }
```

11.创建一个review的子集合Subreview(取review的前五十万条数据), 分别对评论的内容建立全文索引, 对useful建立升序索引, 然后查询评价的内容中包含关键词delicious且useful大于9的评价。

插入数据过程耗时约150s, 建索引耗时约60s。

结果共911条,此处截取前两条.

```
{
  "_id": {
    "$oid": "600d7ea5f5e9bd91d7c3a80d"
  },
  "review_id": "Ec1XsdKPF572zBf9Hz106Q",
  "user_id": "R_xjnz2nZgyOkqFKPmkjNA",
  "business_id": "RBACl6hg2yoaTRv0KKUjPA",
  "stars": 5,
  "useful": 19,
  "funny": 16,
  "cool": 18,
  "text": "Hawaii in Las Vegas, Aloha!!\n\nOne of my yelp friend (Sandra S)
raved about this place on her last visit to sin city. I love Hawaiian food so I
bookmarked it knowing I was going in December. Fast forward a few months and I'm
in Hawaiian Heaven. \n\nHere's the run down:\nFried Mac N Cheese Balls - a good
starter. It was fried perfectly and the mac n cheese was so creamy inside. It was
cheap too. $2.45 for 4 big pieces. Delicious \n\nwe came here for the Poke, we
got:\nShoyu Ahi poke - my favorite, Delicious. \nAhi Furukake poke - it was still
a bit frozen, but still good. \nSpicy Ahi Combo w/ Crabs, Avocados & Cucumber -
my favorite 1A. Delicious\nTako poke w/ Limu (seaweed) - octopus was super
tender. \n The Ahi's were big chunks of raw tuna. So fresh, so good. You've got
to try this place if you like poke. \n\nwe also got some hot dishes.\nLoco Moco -
we were all loco for this dish. The best loco moco I've ever had. The hamburger
was just so flavorful and you get two big hand made patties. The gravy is just
money. With two eggs & two scoops of rice. Oh man, this alone made the trip here
so worth it. Delicious. Must order here. \n\nKaalua Pig & Cabbage - another
winner. Authentic Hawaiian dish. No fake smoke, tender, juicy goodness. Yum yum
yum. \n\nKalbi - Delicious, fall off the bone tender and the marinade was spot
on. Cooked to perfection. Delicious. \n\nHilo Bay Bento Special - this had
everything. A piece of spam, pork cutlet, pork teriyaki, beef short rib, noodles,
pickled radish and all on a bed of rice. This dish is a mouthful and everything
was so so good. It's a special, so they might not have it everyday, but if they
do, get it. You won't regret it. \n\nThe service was very friendly and helpful.
We ordered a lot of food and kept adding to the order and the guy taking the
order was very patient with us. \n\nThe place is small. A few tables (for 2 only)
line the wall. Get your food to go. \n\nI need a nap now after that luau we just
had. \nHawaiian food done right. \n\nSandra, thank you for the
recommendation!!\n\nI'll definitely be back",
```

```

    "date": "2013-12-10 01:05:30"
  }
  {
    "_id": {
      "$oid": "600d7eb7f5e9bd91d7c9b10f"
    },
    "review_id": "0SvurT95Qs0UFZHBXsM5Lw",
    "user_id": "Pf22r1OdtqszHZxHB59vIQ",
    "business_id": "dUffgo9Lh_Vk9TLuFR5ywg",
    "stars": 5,
    "useful": 22,
    "funny": 15,
    "cool": 21,
    "text": "\"I Only Have Pies for You\"\\n(Parody of \"Superstition\", Stevie wonder)\\n\\nTotally delicious, side of mac n' cheese\\nPiled with chipotle pesto, add some bacon, please\\nMinestrumbo soup yeah, is it a soup or stew?\\nMeatballs, zuchs, and sausage, in a tomato brew\\n\\nTotally delicious, pasta, \"Coop de ville\"\\nChix on fettuccini, fills me to the gill\\n\"Lady is a Scampi\", wild caught, yummy shrimp\\nChipotle sauce on pasta, spicy, not for wimps\\n\\nWhen you eat somewhere else, you just don't understand\\nThat you'll starve, yeah...Oregano's the way\\nFor lunch or supper\\nMake sure to stop in today\\n\\nTotally delicious, Pizza de Resistance\\n\"Aunt Margherita Special\", dripping with 4-cheese sauce\\n\"Fancy Dancy Mushroom\", with a truffle spread\\nPortobello mushrooms, side of cheesy bread\\n\\nTotally delicious, only have pies for you\\n\"Sproccoli\" veg pizza, greens for you to chew\\nOld world \"Bistro Classic\", brushed with garlic sauce\\nKeep away the vampires, add basil, it's the boss\\n\\nWhen you eat somewhere else, you just don't understand\\nThat you'll starve, yeah...Oregano's the way\\nFor lunch or supper\\nMake sure to stop in today\\n\\nTotally delicious, dessert is on the way\\nTopped with scoops of ice cream, cookies baked today\\n1/2 pound-pizookie, salted caramel\\nMacadamia nuts, chocolate chips as well\\n\\nSo slightly baked in a 6-inch pizza pan\\nIt's amazing! Eat it if you can, yeah, yeah\\nPizookie! \\nEat it if you can...\\n\\n~The Nosy Norwegian\\nSniffing out pizza pies and good deals so that you don't have to",
    "date": "2017-07-07 17:18:05"
  }
}

```

12.在Subreview集合中统计评价中useful、funny和cool都大于6的商家，返回商家id及平均打星，并按商家id降序排列。

共1558条记录，下面截取了前5条

```

{
  "stars_avg": 2,
  "business_id": "zvQIEpJUmLLmMMffNntHXQ"
}
{
  "stars_avg": 4.5,
  "business_id": "zrYpLdnGKA_EmOhgRCy_vg"
}
{
  "stars_avg": 4,
  "business_id": "znWHLW1pt19Hzw1VY6KfCA"
}
{
  "stars_avg": 3,
  "business_id": "znBAFVFRMvdUvJ7eJY_vjA"
}

```

```
{
  "stars_avg": 4,
  "business_id": "zitXLajbETouHQJfok4a4g"
}
```

13.查询距离商家xvX2CttrVhyG2z1dFg_0xw(business_id) 100米以内的商家，只需要返回商家名字，地址和星级。

提示：使用2dsphere建立索引、获取商家地理坐标、使用坐标进行查询

```
{
  name: 'Farmers Insurance - Paul Lorenz',
  address: '15655 W Roosevelt St, Ste 237',
  stars: 5
}
{
  name: 'Kurt Bojarski - American Family Insurance',
  address: '15655 W Roosevelt St, Ste 101',
  stars: 5
}
```

14.在集合Subreview上建立索引，统计出用户从2017年开始发出的评价有多少，按照评价次数降序排序，需要返回用户id和评价总次数，只显示前20条结果。

共20条记录，此处展示5条

```
{
  total: 61,
  user_id: 'I-4KVZ9lqHhk8469x9Fvha'
}
{
  total: 46,
  user_id: 'qKpkRCPk4ycb1lTfFcRbNw'
}
{
  total: 42,
  user_id: 'bLbSNkLggFnqWNNzzq-Ijw'
}
{
  total: 37,
  user_id: 'ic-tyi1jEL_umxZVh8KNA'
}
{
  total: 32,
  user_id: 'z9w399cBpCAKxhH_JA1AtQ'
}
```

c). MapReduce的使用:

15.使用map reduce计算每个商家的评价的平均分（建议在Subreview集合上做，review过于大），不要直接使用聚合函数。

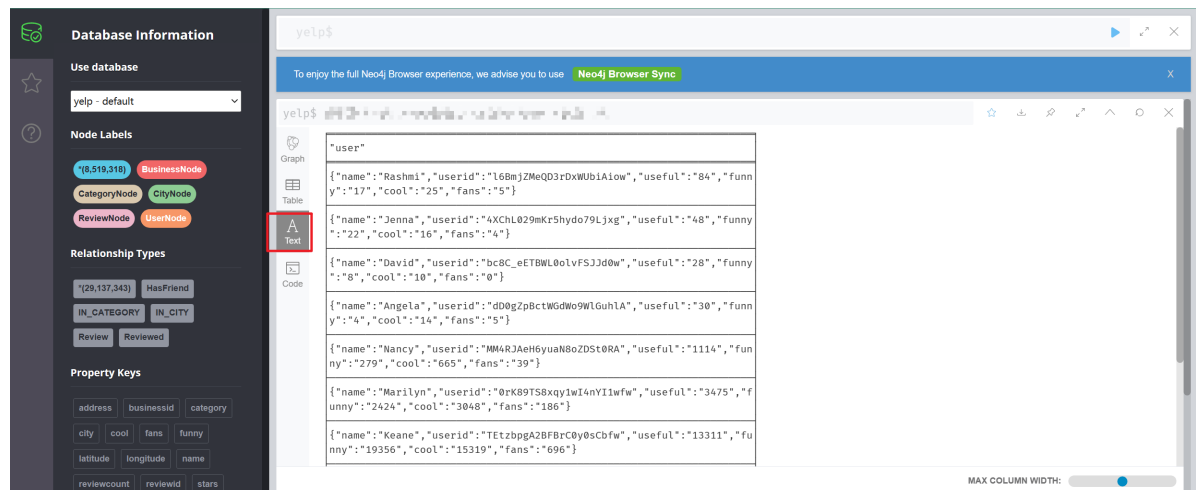
结果输出到集合test_map_reduce。

最终集合test_map_reduce共18983条记录，前5条记录如下：

```
{ "_id" : "--Gc998IMjLn8yr-HTzGUg", "value" : { "count" : 2, "stars" : 6, "avg" : 3 } }
{ "_id" : "--I7YYLada0tSLkORTHb5Q", "value" : { "count" : 84, "stars" : 291, "avg" : 3.4642857142857144 } }
{ "_id" : "--U98MNlDym2cLn36BBPgq", "value" : { "count" : 3, "stars" : 7, "avg" : 2.3333333333333335 } }
{ "_id" : "--j-kaNMC01-DYzddCsA5Q", "value" : { "count" : 4, "stars" : 16, "avg" : 4 } }
{ "_id" : "--wIGbLEhlpI_UeAiyDmZQ", "value" : { "count" : 10, "stars" : 43, "avg" : 4.3 } }
```

任务3:Neo4j

以下使用Text进行查看

The screenshot shows the Neo4j Browser interface. On the left, the 'Database Information' sidebar is visible, showing the 'yelp' database and various node labels like 'BusinessNode', 'CityNode', 'ReviewNode', and 'UserNode'. The main area displays a text query result for the 'user' node. The query is: `cypher> MATCH (u:user) RETURN u.name, u.userid, u.useful, u.funny, u.cool, u.fans`. The result shows a list of user nodes with their attributes. The 'Text' tab is selected, and the query is executed successfully.

1.查询标签是CityNode的节点，限制10个。

//简单查询，limit

```
| "city" |
|-----|
| {"city": "Agincourt"} |
|-----|
| {"city": "Sharon"} |
|-----|
| {"city": "Ivesdale"} |
|-----|
| {"city": "Bedford Hts."} |
|-----|
| {"city": "Valencia"} |
|-----|
| {"city": "N Ridgeville"} |
|-----|
| {"city": "West Toronto"} |
```

```

{"city": "Median"}
{"city": "Fort McDowell"}
{"city": "Concord Twp"}

```

2. 查询城市是Ambridge的商家节点。

共36条记录,此处截取前5条

```

"business"

{"reviewcount": "3", "address": "400 Merchant St", "city": "Ambridge", "latitude": "40.5840997", "businessid": "dJ0R-Xt78LUQeNHQkD-G9g", "name": "Ice Cream Therapy", "stars": "3.5", "longitude": "-80.225135"}

{"reviewcount": "4", "address": "304 Duss Ave", "city": "Ambridge", "latitude": "40.5823797", "businessid": "3gL18exylqutlzb6TmB0w", "name": "Action Tire Company", "stars": "5.0", "longitude": "-80.2238749"}

{"reviewcount": "18", "address": "603 Duss Ave", "city": "Ambridge", "latitude": "40.5879393", "businessid": "Q_0eG1-aElqHKukHvmLdwA", "name": "Nelia's Smokehouse", "stars": "4.0", "longitude": "-80.2248851"}

{"reviewcount": "14", "address": "755 Merchant St", "city": "Ambridge", "latitude": "40.5886057", "businessid": "Eu_zPTrNVAXkpdSxf7CJ2w", "name": "K & N Restaurant", "stars": "4.5", "longitude": "-80.2291033"}

{"reviewcount": "4", "address": "663 Merchant St", "city": "Ambridge", "latitude": "40.5876498", "businessid": "Yjf0i2J9q52dYIT8UvGT3g", "name": "Heritage Floral Shoppe", "stars": "4.5", "longitude": "-80.2284934"}

```

3. 查询reviewid是rElTo90tpyKmEfNDp3Ou3A对应的business信息。

共1条记录//简单关系条件查询

```

"business"

{"reviewcount": "106", "address": "2800 E Germann Rd", "city": "Chandler", "latitude": "33.278104", "businessid": "6lj2BJ4tJeu7db5asGHQ4w", "name": "Slim Chickens", "stars": "3.0", "longitude": "-111.7924641"}

```

4. 查询评价过businessid是fyJAqmweGm8VXnpU4CWGNw商家的用户的名字和粉丝数。

共345条记录,此处截取前5条 //简单关系条件查询,返回特定列

"user.name"	"user.fans"
"Linda"	"0"
"Joseph"	"0"
"Brittanie"	"24"
"Melinda"	"17"
"kellie"	"1"

5.查询被userid为TEtzbpgA2BFBrC0y0sCbfw的用户评论为5星的商家名称和地址。

共7条记录 //多关系条件查询

"business.name"	"business.address"
"The Buffet"	"3131 Las Vegas Blvd S"
"MGM Grand Hotel"	"3799 Las Vegas Blvd S"
"Paris Las Vegas Hotel & Casino"	"3655 Las Vegas Blvd S"
"Blue Man Group"	"3900 Las Vegas Blvd S"
"Burger Bar"	"3930 S Las Vegas Blvd, Ste 121A"
"Bellagio Hotel"	"3600 S Las Vegas Blvd"
"The Venetian Las Vegas"	"3355 South Las Vegas Boulevard"

6.查询商家名及对应的星级和地址，按照星级降序排序（限制15条）。

共15条记录 ,这里答案有可能不唯一 //查询排序

"business.name"	"business.stars"	"business.address"
"Moochs Munchies"	"5.0"	"101 S Rainbow Blvd, Ste 16"
"Broadview Local Lock and Key"	"5.0"	"
"North Coast Natural Health & Acupuncture"	"5.0"	"3929 Center Rd"
"Motorcycle Towing Toronto"	"5.0"	"
"MSW Contracting"	"5.0"	"2875 W Ray Rd, Ste 6 & 246"

"Place Western"	"5.0"	"5014 Avenue du Parc"
"Accurate Dental Care"	"5.0"	"1731 W Baseline Rd, Ste 104"
		"
"JF Salon & Spa"	"5.0"	"2229 Village Lake Dr, Ste A"
		"
"86'd Eats"	"5.0"	"3667 Las Vegas Blvd"
"HIIT Life Fitness"	"5.0"	"6825 W Russell Rd, Ste 105"
"Rounds Tackett Group with RE/MAX Fine Properties"	"5.0"	"21000 N Pima Rd"
"Epic Tattoo"	"5.0"	"5117 W Thunderbird Rd"
"Americana Inspection Services"	"5.0"	"
"Tik's Quick Towing"	"5.0"	"4570 E Carey Ave, Ste 2"
"Ocean Cabinetry & Furniture"	"5.0"	"4579 W Flamingo Rd"
"		

7.使用where查询粉丝数大于200的用户的名字和粉丝数（限制10条）。

10条记录//where查询

"user.name"	"user.fans"
"keane"	"696"
"Annie"	"407"
"Jason"	"251"
"Regina"	"231"
"Alma"	"272"
"Diana"	"286"
"kelley"	"550"
"Archie"	"317"
"Arden"	"215"
"Leeanna"	"338"

8.查询businessid是tyjquHslrAuF5EUejbPfrw商家包含的种类数,并使用PROFILE查看执行计划,进行说明。

1条记录//count

"count(c)"
4

执行计划是图的形式,注意每个步骤结束产生的记录。

9.查询businessid是tyjquHslrAuF5EUejbPfrw商家包含的种类,以list的形式返回。

1条记录//collect

"category"
[" Latin American", " Venezuelan", " Restaurants", "Mexican"]

10.查询Allison的朋友(直接相邻)分别有多少位朋友。(考察:使用with传递查询结果到后续的处理)

共16836条记录,此处截取前5条

"friendsList"	"numberOfFoFs"
["David"]	12
["Regina"]	64
["Michael"]	584
["Greg"]	146
["Jennifer"]	750

11.查询拥有类别为Salad的商家数量前5的城市,返回城市名称和商家数量。

共5条记录//条件查询、count

"business.city"	"count(*)"
"Toronto"	52
"Charlotte"	40
"Phoenix"	39
"Las Vegas"	39
"Scottsdale"	19

12.查询商家名重复次数前10的商家名及其次数。

共10条记录//条件查询、count

"name"	"cnt"
"Starbucks"	1066
"McDonald's"	806
"Subway"	768
"Tim Hortons"	333
"Pizza Hut"	320
"Taco Bell"	313
"Burger King"	302
"Walgreens"	301
"Wendy's"	294
"The UPS Store"	279

13.统计评价数大于5000的商家名热度（名字的重复的次数在所有的商家名中的占比），按照评价数量排序，返回热度和商家名和评价数。

6条记录/多关系联合查询、结果计算

"count(business.name) * 1.0 / cnt"	"business.name"	"business.reviewcount"
0.000006894364546419757	"Mon Ami Gabi"	"8348"

0.000006894364546419757	"Bacchanal Buffet"	"8339"
0.000006894364546419757	"Wicked Spoon"	"6708"
0.000006894364546419757	"Hash House A Go Go"	"5763"
0.000006894364546419757	"Gordon Ramsay BurGR"	"5484"
0.000006894364546419757	"Earl of Sandwich"	"5075"

14.查询具有评分为5.0的Zoos类别的商铺所在城市。

5条记录//多关系联合查询

"city"
"Toronto"
"Cave Creek"
"Las Vegas"
"Calgary"
"waddell"

15.统计每个商家被多少个不同用户评论过，按照此数量降序排列，返回商家id，商家名和此商家被多少个不同用户评论过，结果限制10条记录。

"business.businessid"	"business.name"	"user_count"
"4JNXUY8wbaaDmk3BPzlw"	"Mon Ami Gabi"	8349
"RESDUcs7fIiihp38-d6_6g"	"Bacchanal Buffet"	8341
"K7lWdNuhCbcnEvI0NhGewg"	"Wicked Spoon"	6710
"f4x1YBxkLrZg652xt2KR5g"	"Hash House A Go Go"	5763
"cYwJA2A6I12KNkm2rtXd5g"	"Gordon Ramsay BurGR"	5484

"DkYS3arLOhA8si5uUEmHOW"	"Earl of Sandwich"	5076
"2weQS-RnoOBhb1KsHKyoSQ"	"The Buffet"	4401
"5LNZ67Yw9RD6nf4_UhXOjw"	"The Cosmopolitan of Las Vegas"	4322
"iCQpiavjjPzJ5_3gPD5Ebg"	"Secret Pizza"	4286
"ujHiaprwCQ5ewziu0Vi9rw"	"The Buffet at Bellagio"	4230

16.体会建立索引对查询带来的性能提升，但会导致插入，删除等操作变慢（需要额外维护索引代价）。

- 准备工作，使用语句为用户Node新建一个属性 flag 用来实验
- 对用户Node的flag属性执行查询（flag>8000）、创建（flag=10000）、更新（flag=456 to flag=3456）、删除（flag>4000）操作
- 重置属性信息
- 为用户Node的属性flag建立索引
- 对用户Node的flag属性执行相同的查询、创建、更新、删除操作，比较操作时间

17.查询与用户 user1 (userid: tvZKPah2u9G9dFBg5GT0eg) 不是朋友关系的用户中和 user1 评价过相同的商家的用户，返回用户名、共同评价的商家的数量，按照评价数量降序排序（查看该查询计划，并尝试根据查询计划优化）。

共4904条记录,这里展示前5条

"user1.name"	"user2.name"	"sum"
"Emily"	"David"	257
"Emily"	"Michael"	220
"Emily"	"Chris"	194
"Emily"	"Jennifer"	186
"Emily"	"John"	185

//Started streaming 4904 records after 10 ms and completed after 11 ms, displaying first 1000 rows.

18.分别使用Neo4j和MongoDB查询review_id为TIYgnDzezfeEnVeu9jHeEw对应的business信息，比较两者查询时间，指出Neo4j和MongoDB主要的适用场景。

```
//MongoDB结果
{
  _id: ObjectId("600d7ea4f5e9bd91d7c33032"),
  review_id: 'TIYgnDzezfeEnVeu9jHeEw',
  user_id: 'Drr9IQ_vnB-8yiUyt-jBPw',
  business_id: 'I3UkP4Mmp0cmfe3vTev0jw',
  stars: 4,
```



```
useful: 7,
funny: 1,
cool: 1,
text: `I have tried 3 other sushi places and have always been greatly
disappointed. A friend recommended this one and I decided to give it a chance
before I gave up looking for affordable, tasty sushi in this city. I must say
this place is good quality for the price. First off, you can't really expect the
best sushi when it's "all you can eat" but this place had a good variety, it
wasn't just crab and shrimp. The food was fresh, we were treated well by the
employees, it's BYOB and truly all you can eat, including deserts :) not bad for
$25 a person! Not the best sushi, but the best without breaking your wallet that
I've found in the plateau.` ,
date: '2012-11-06 20:52:22',
review_business: [
  {
    _id: ObjectId("6016c6b5af81085b0f21b190"),
    business_id: 'I3UkP4Mmp0cmfe3vTev0jw',
    name: 'Sushi 999',
    address: '405 Rue Sherbrooke Est',
    city: 'Montréal',
    state: 'QC',
    postal_code: 'H2L 1J9',
    latitude: 45.517348,
    longitude: -73.5677004,
    stars: 2.5,
    review_count: 39,
    is_open: 0,
    attributes: {
      RestaurantsGoodForGroups: 'True',
      BikeParking: 'False',
      NoiseLevel: "u'average'",
      GoodForKids: 'True',
      WiFi: "u'free'",
      BusinessParking: '{"garage': False, 'street': True, 'validated': False,
'lot': False, 'valet': False}",
      RestaurantsDelivery: 'True',
      RestaurantsReservations: 'True',
      Alcohol: "'beer_and_wine'",
      HasTV: 'True',
      RestaurantsPriceRange2: '2',
      OutdoorSeating: 'False',
      RestaurantsTakeOut: 'True',
      RestaurantsAttire: "u'casual'",
      Ambience: '{"romantic': False, 'intimate': False, 'classy': False,
'hipster': False, 'divey': False, 'touristy': False, 'trendy': False, 'upscale':
False, 'casual': True}"
    },
    categories: [
      'Sushi Bars',
      'Japanese',
      'Restaurants'
    ],
    hours: null,
    loc: {
      type: 'Point',
      coordinates: [
        -73.5677004,
        45.517348
      ]
    }
  }
]
```

```
}
  }
}
]
```

//neo4j结果

```
"b"
[{"reviewcount":"39","address":"405 Rue Sherbrooke Est","city":"Montréal",
"latitude":"45.517348","businessid":"I3UkP4Mmp0cmfe3vTev0jw","name":
:"Sushi 999","stars":"2.5","longitude":"-73.5677004"}]
```

提示：某次查询时长对比是2：1。

任务4：多数据库交互应用实验

1.使用Neo4j查找：找出评论过超过5家不同商户的用户，并在Neo4j以表格形式输出满足以上条件的每个用户的信息：name,funny,fans。

134658条记录，只截取了10条，查询耗时长，需要等待几分钟

"name"	"funny"	"fans"
"Janet"	"0"	"0"
"Eve"	"28"	"4"
"Bernie"	"886"	"57"
"Curt"	"40"	"2"
"Filip"	"22"	"1"
"Merrill"	"3"	"0"
"Soleil"	"18286"	"278"
"Wojtek"	"19"	"1"
"Melissa"	"1"	"0"
"Beverly"	"12"	"12"

2.将1得到的结果导入MongoDB，并使用该表格数据，统计其中所有出现的用户名及该用户名对应的出现次数，并按照出现次数降序排序,使用aggregate实现。

提示：

- 1) 从Neo4j的查询中导出csv文件
- 2) 在mongodb新建集合from_neo4j，将csv文件导入集合

3) 统计其中所有出现的商家名及该商家名对应的出现次数，并按照出现次数降序排序。

共144427条记录，两种方式导出的集合可能排列顺序不同。

aggregate方式产生的记录的前5条：

```
_id: "Jennifer"
cnt: 527
```

```
_id: "John"
cnt: 460
```

```
_id: "David"
cnt: 458
```

```
_id: "Michael"
cnt: 456
```

```
_id: "Chris"
cnt: 441
```

3.在Neo4j中查找所有商家，要求返回商家的名字，所在城市、商铺类。

(a) 将查找结果导入MongoDB中实现对数据的去重（提示：使用aggregate，仅保留城市、商铺类型即可）

(b) 将去重后的结果导入Neo4j中的新库result中，完成（City-[Has]->Category）图谱的构建。

1) 在Neo4j中查找所有商家所在的城市和商家的类别，导入mongodb中yelp下的testrecords进行查询。

共788359条记录，截取5条，耗时几分钟

"name"	"city"	"category"
"Canyon State Propane"	"Phoenix"	"Propane"
"E&H Ace Hardware"	"Avon Lake"	"Propane"
"AZ Propane Express"	"Chandler"	"Propane"
"U-Haul Moving & Storage at Boulder Hwy"	"Las Vegas"	"Propane"
"U-Haul Moving & Storage of Concord"	"Concord"	"Propane"

去重之后记录数79万->9万。

导入Neo4j构成图谱，显示城市及对应的商铺种类关系：

city-[has]->category







1.CityNode

2.CategoryNode

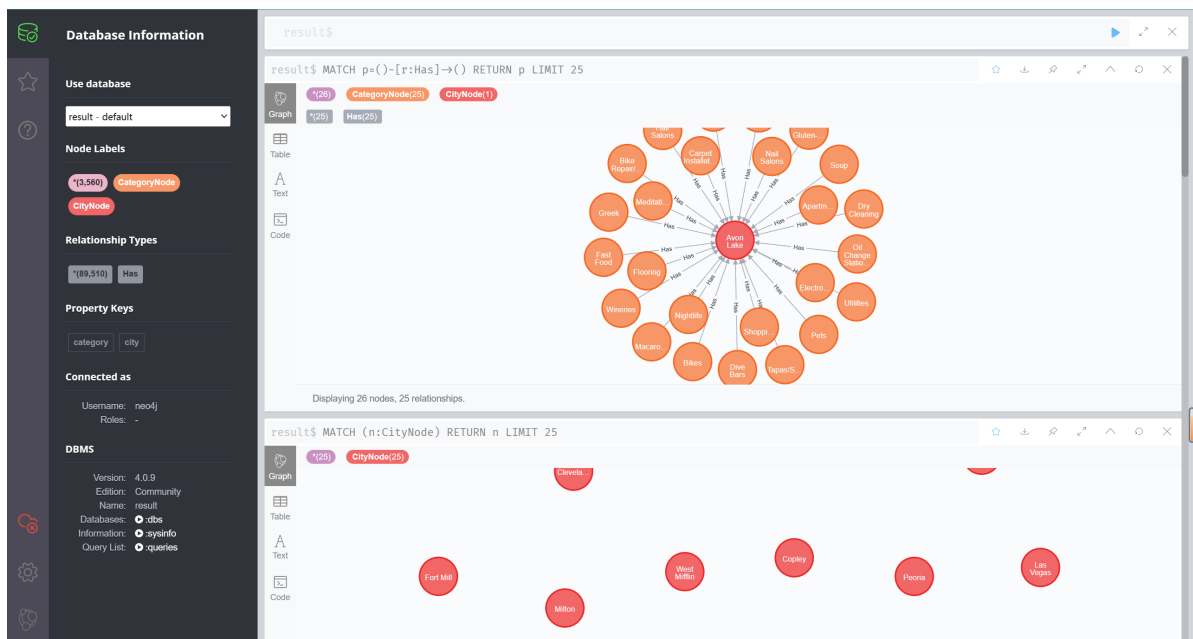
3.city_Has_category

构建文件：

名称

 city_Has_category.csv CategoryNode.csv CityNode.csv city_Has_category_header.csv category_header.csv city_header.csv

使用命令，导入Neo4j，查看导入结果：



任务5：不同类型数据库MVCC多版本并发控制对比实验

读写并发，写写并法，分片集群部署情况（可选）