Hands-on Lab: Working with Databases in Cloudant

Estimated time needed: **30** minutes

Objectives

After completing this lab you will be able to:

- Create a database through the Cloudant dashboard
- Insert documents into your database to populate it
- Query documents with specific criteria
- Modify documents by updating and deleting them

Prerequisites

In order to complete this lab, you will need to create an instance of Cloudant on IBM Cloud. If you haven't yet created one, you can create one by referring to the Create an Instance of IBM Cloudant lab.

Note: While working on this lab, you may be prompted to login when ever your session expires. Use your credentials to authentiate. This may happen when you step out or leave your Cloudant session unattented.

Exercise 1 - Launch Cloudant Dashboard

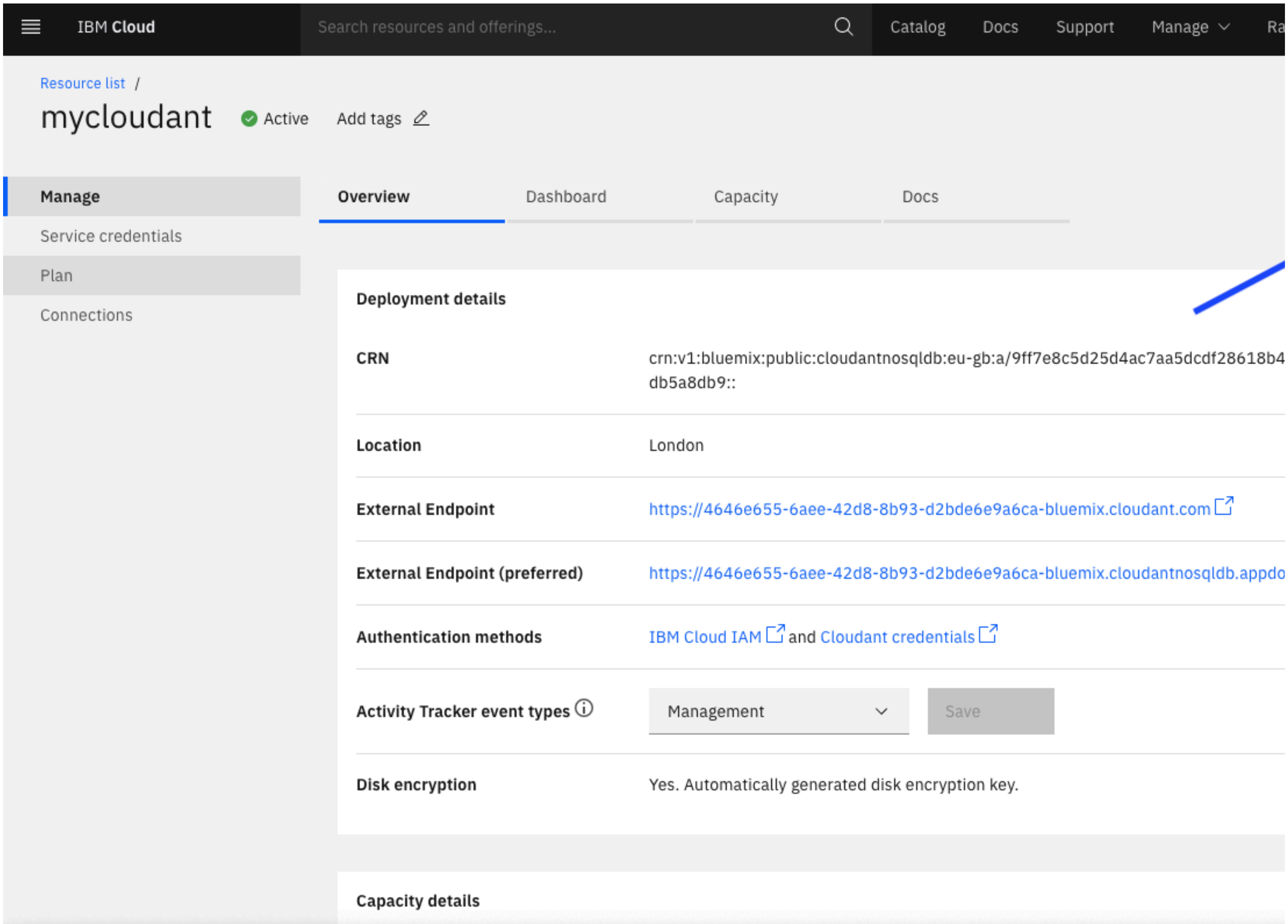
Step 1: Click on cloud.ibm.com/resources.

Step 2: Click on the Databases chevron.

Step 3: Click on your instance of Cloudant.

▶ Click here for Hint

Step 4: Click on `Launch Dashboard`.



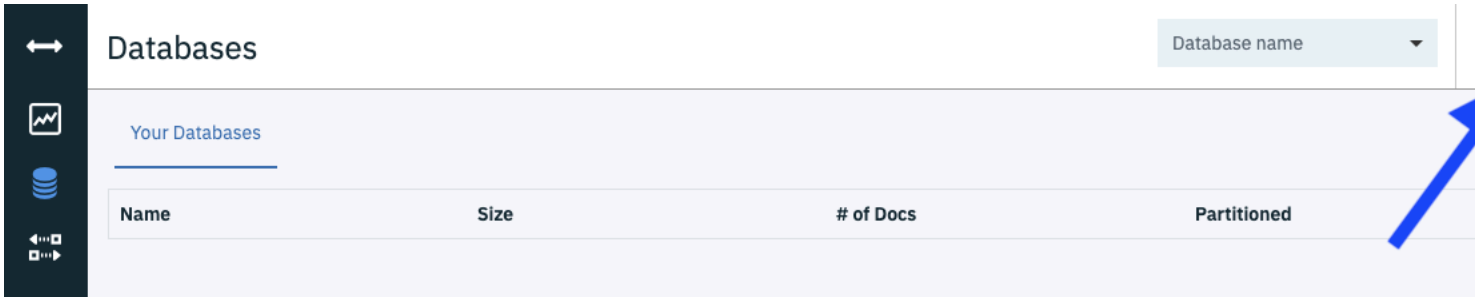
Deployment details

CRN	crn:v1:bluemix:public:cloudantnosqldb:eu-gb:a/9ff7e8c5d25d4ac7aa5dcdf28618b4 db5a8db9::
Location	London
External Endpoint	https://4646e655-6aee-42d8-8b93-d2bde6e9a6ca-bluemix.cloudant.com
External Endpoint (preferred)	https://4646e655-6aee-42d8-8b93-d2bde6e9a6ca-bluemix.cloudantnosqldb.appdo
Authentication methods	IBM Cloud IAM and Cloudant credentials
Activity Tracker event types	Management
Disk encryption	Yes. Automatically generated disk encryption key.

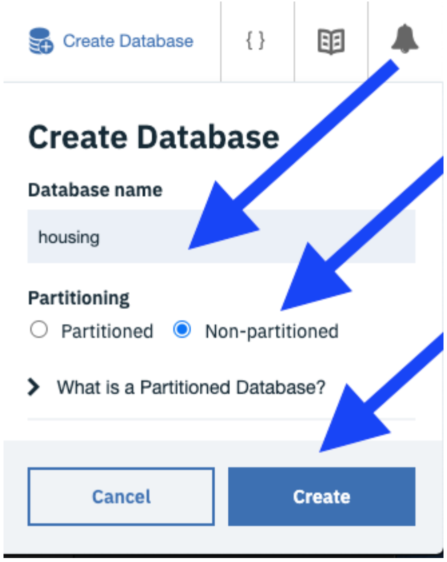
Capacity details

Exercise 2 - Create Database

Step 1: On the dashboard click on `Create Database`.



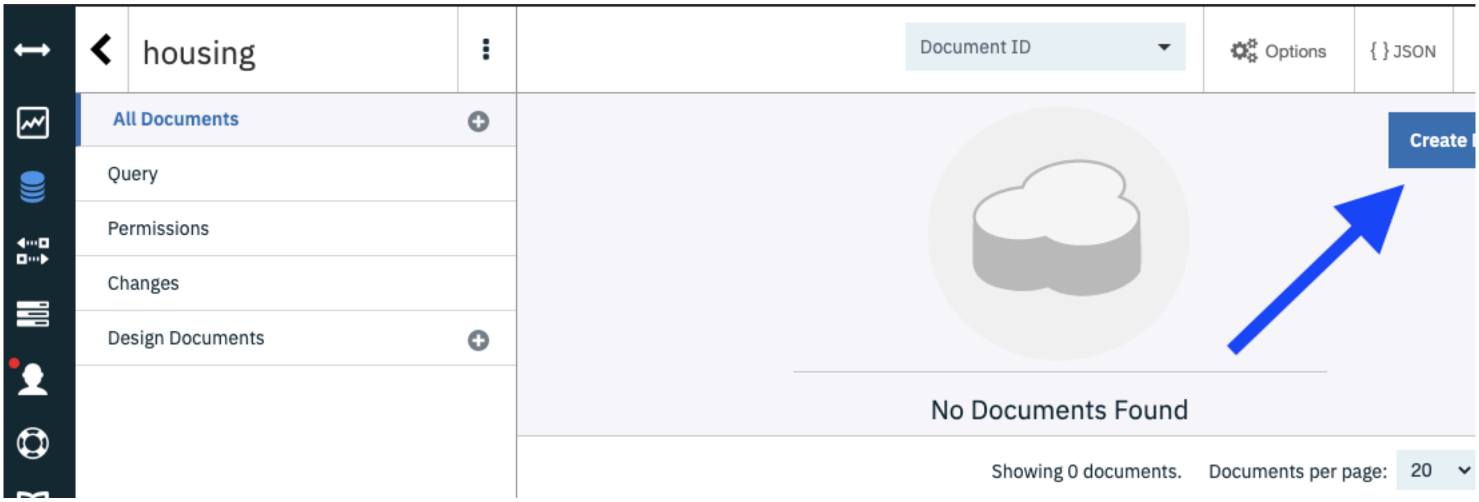
Step 2: Type **housing** as database name. Select ‘Non-partitioned’ and click on `Create`.



Database name: housing

Partitioning: ○ Partitioned ● Non-partitioned

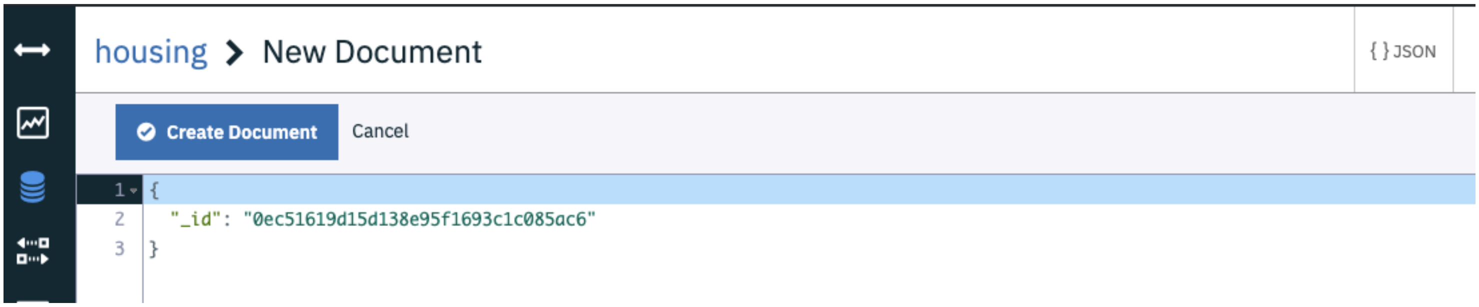
In a few moments the database will be created. and you will be taken to a page that looks like the one below.



Exercise 3 - Insert documents

Step 1: Click on `Create Document` to insert a document.

You will be presented the below screen, with a simple sample document.



```
{
  "_id": "0ec51619d15d138e95f1693c1c085ac6"
}
```

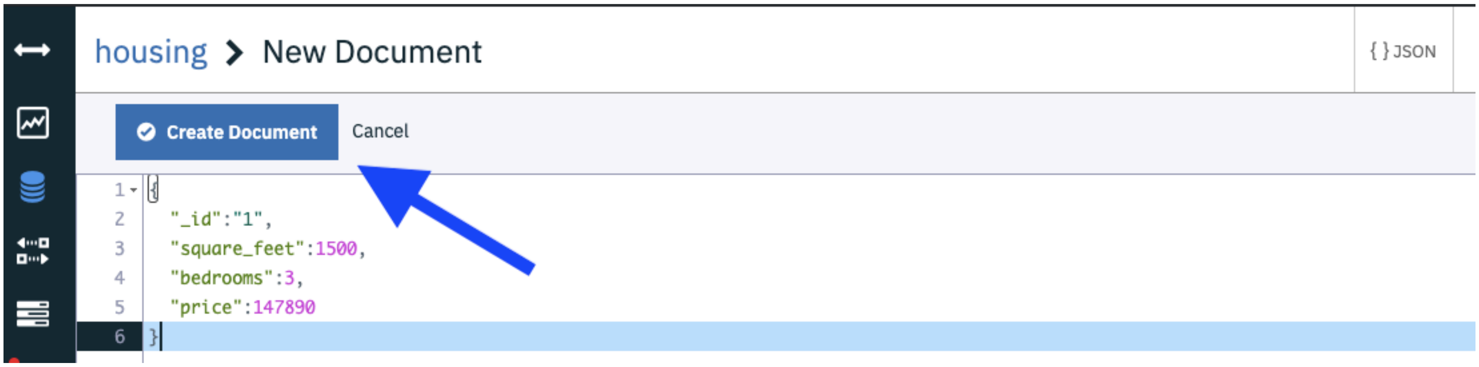
Cloudant uses `_id` key to uniquely identify a document. It is equivalent to the primary key in RDBMS. You can use your own custom values for `_id`.

Copy and paste the below json document and click on `Create Document` button, as show in the image below.

```

{
    "_id":"1",
    "square_feet":1500,
    "bedrooms":3,
    "price":147890
}
```

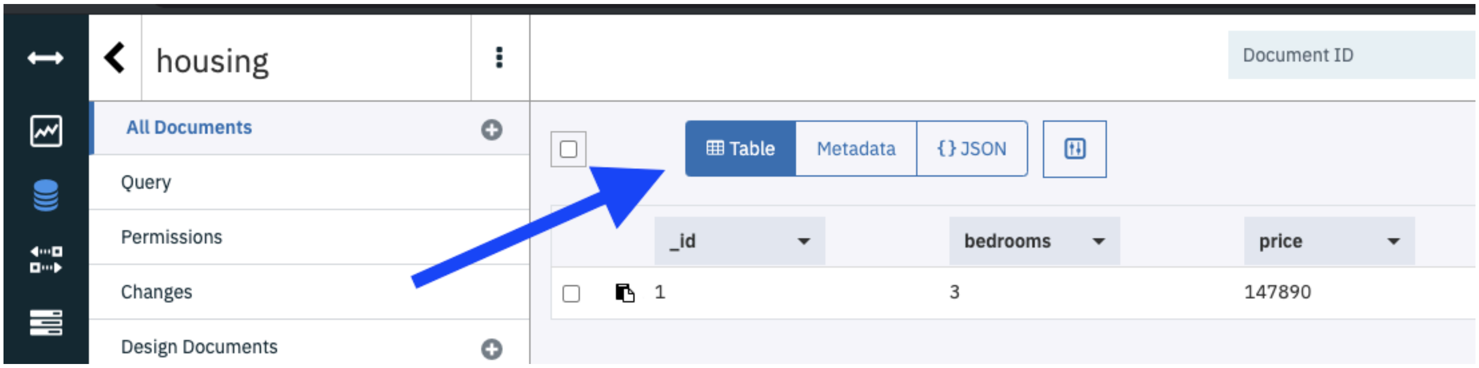
Copied!



```
{
  "_id":"1",
  "square_feet":1500,
  "bedrooms":3,
  "price":147890
}
```

Once the document is created, Cloudant will take you to a page with the list of documents.

Click on the `Table` view button. You should see a screen similar to the one below.



□	_id	bedrooms	price
□	1	3	147890

Follow the above mentioned process and insert the below 4 documents. Ensure you only insert one document at a time.

```
{
    "_id":"2",
    "square_feet":1800,
    "bedrooms":3,
    "price":182650
}
```

Copied!

```

{
    "_id":"3",
    "square_feet":2000,
    "bedrooms":3,
    "price":201260
}
```

Copied!

```

{
    "_id":"4",
    "square_feet":2200,
    "bedrooms":4,
    "price":234980
}
```

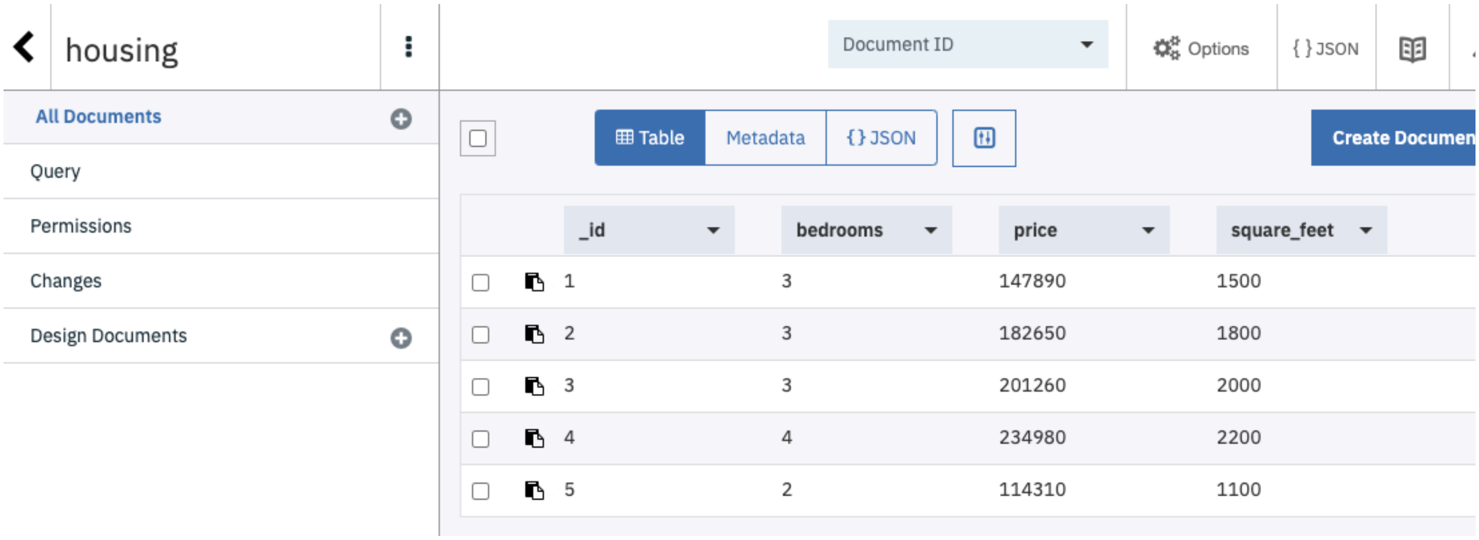
Copied!

```

{
    "_id":"5",
    "square_feet":1100,
    "bedrooms":2,
    "price":114310
}
```

Copied!

After inserting the above documents your database should look like this.



_id	bedrooms	price	square_feet
1	3	147890	1500
2	3	182650	1800
3	3	201260	2000
4	4	234980	2200
5	2	114310	1100

Cloudant is a NoSQL database. It is a schema less database. All documents in a database need not have the same schema.

Let us insert two documents that have additional keys, compared to the previously inserted documents.

```
8
9
```

```

{
    "_id":"6",
    "square_feet":1400,
    "bedrooms":3,
    "price":123140,
    "type":"apartment",
    "floor":5
}
```

Copied!

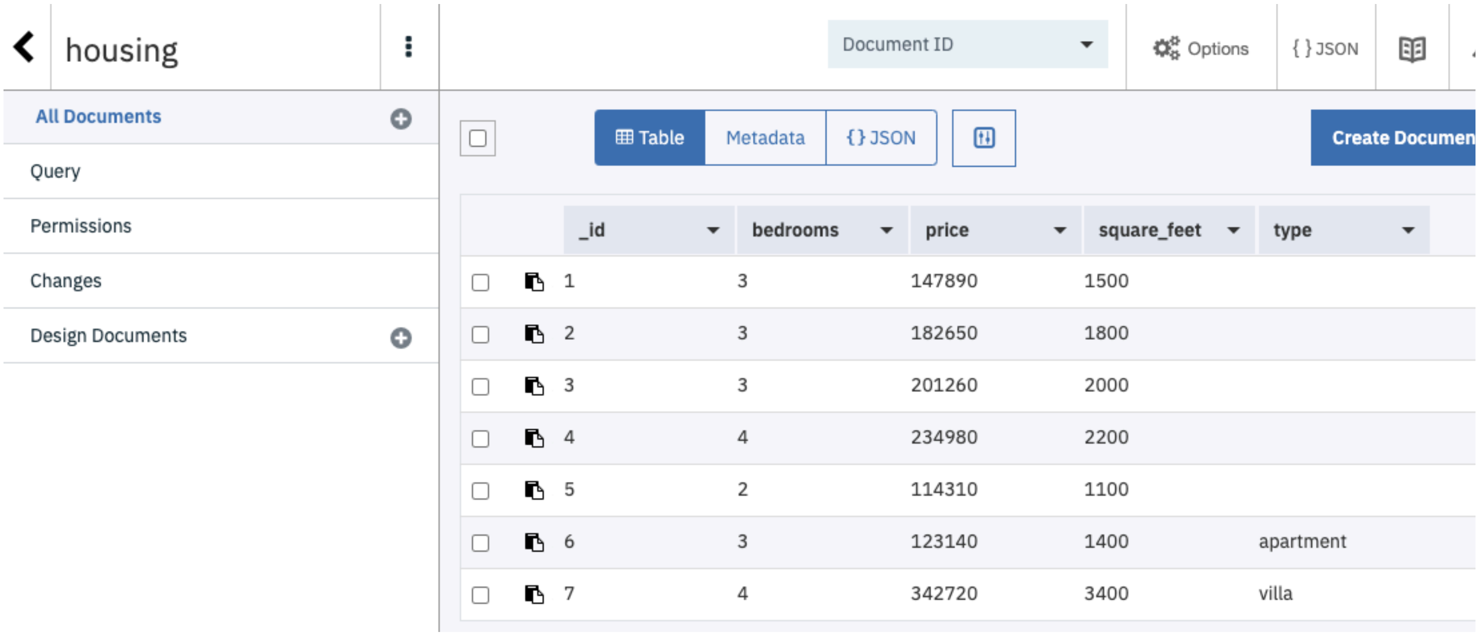
```
1
2
3
4
5
6
7
8
9
```

```

{
    "_id":"7",
    "square_feet":3400,
    "bedrooms":4,
    "price":342720,
    "type":"villa",
    "car_parks":3
}
```

Copied!

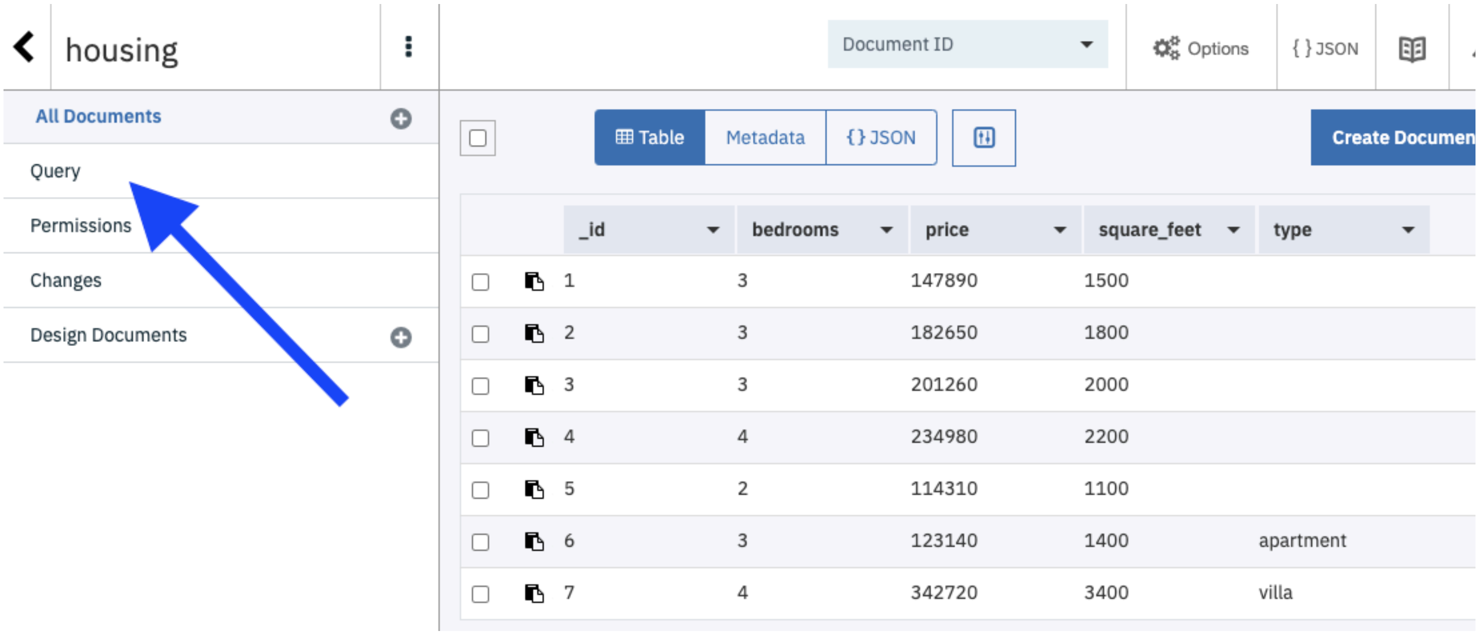
After inserting the above documents your database should now look like this.



_id	bedrooms	price	square_feet	type
1	3	147890	1500	
2	3	182650	1800	
3	3	201260	2000	
4	4	234980	2200	
5	2	114310	1100	
6	3	123140	1400	apartment
7	4	342720	3400	villa

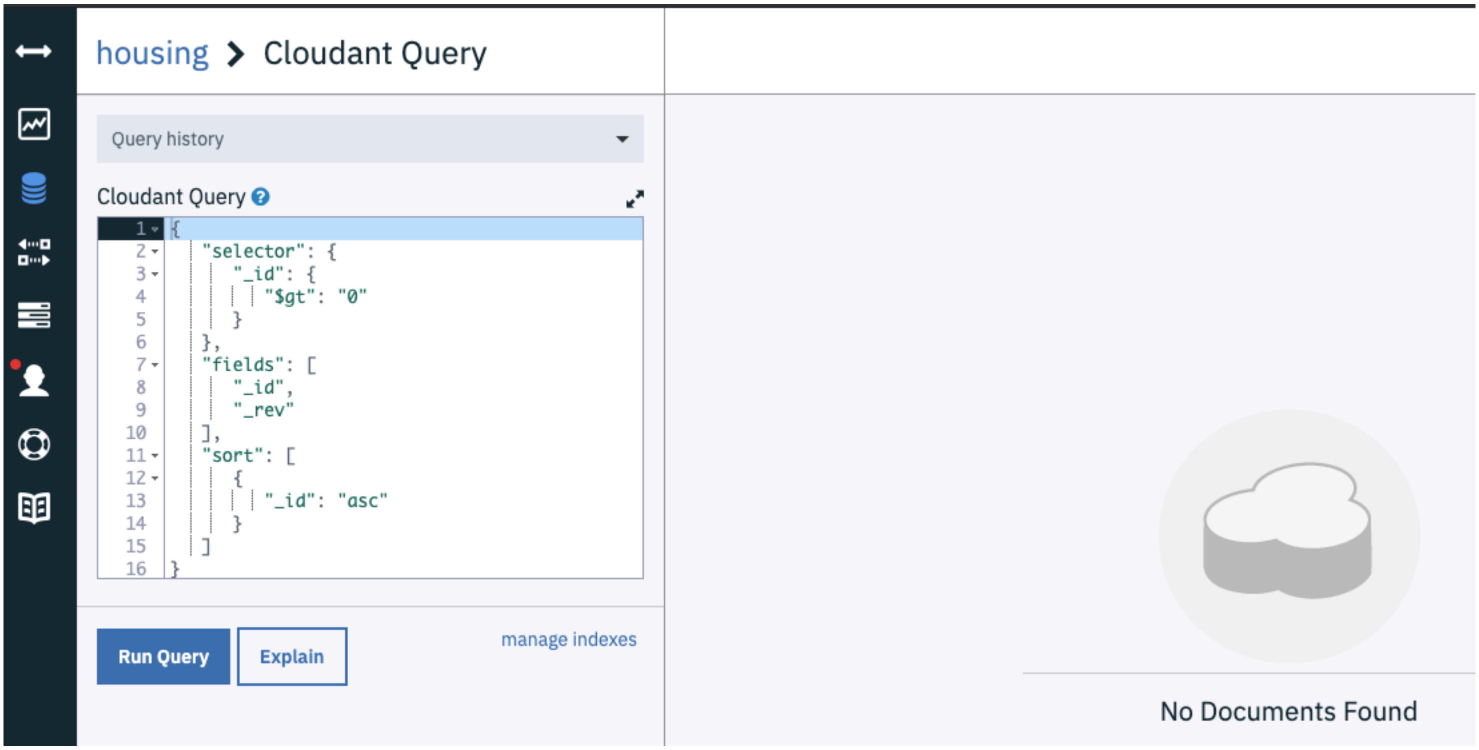
Exercise 4 - Query documents

Click on `Query` as shown in the image below.



_id	bedrooms	price	square_feet	type
1	3	147890	1500	
2	3	182650	1800	
3	3	201260	2000	
4	4	234980	2200	
5	2	114310	1100	
6	3	123140	1400	apartment
7	4	342720	3400	villa

You will see a screen like this.

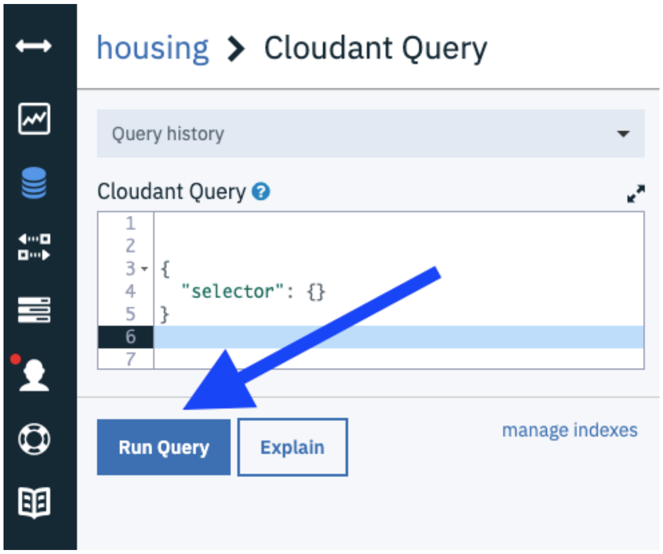


```
{
  "selector": {
    "_id": {
      "$gt": "0"
    }
  },
  "fields": [
    "_id",
    "_rev"
  ],
  "sort": [
    {
      "_id": "asc"
    }
  ]
}
```

Replace the default query with the one given below, and click on the `Run Query` button.

```
{
    "selector": {}
}
```

Copied!

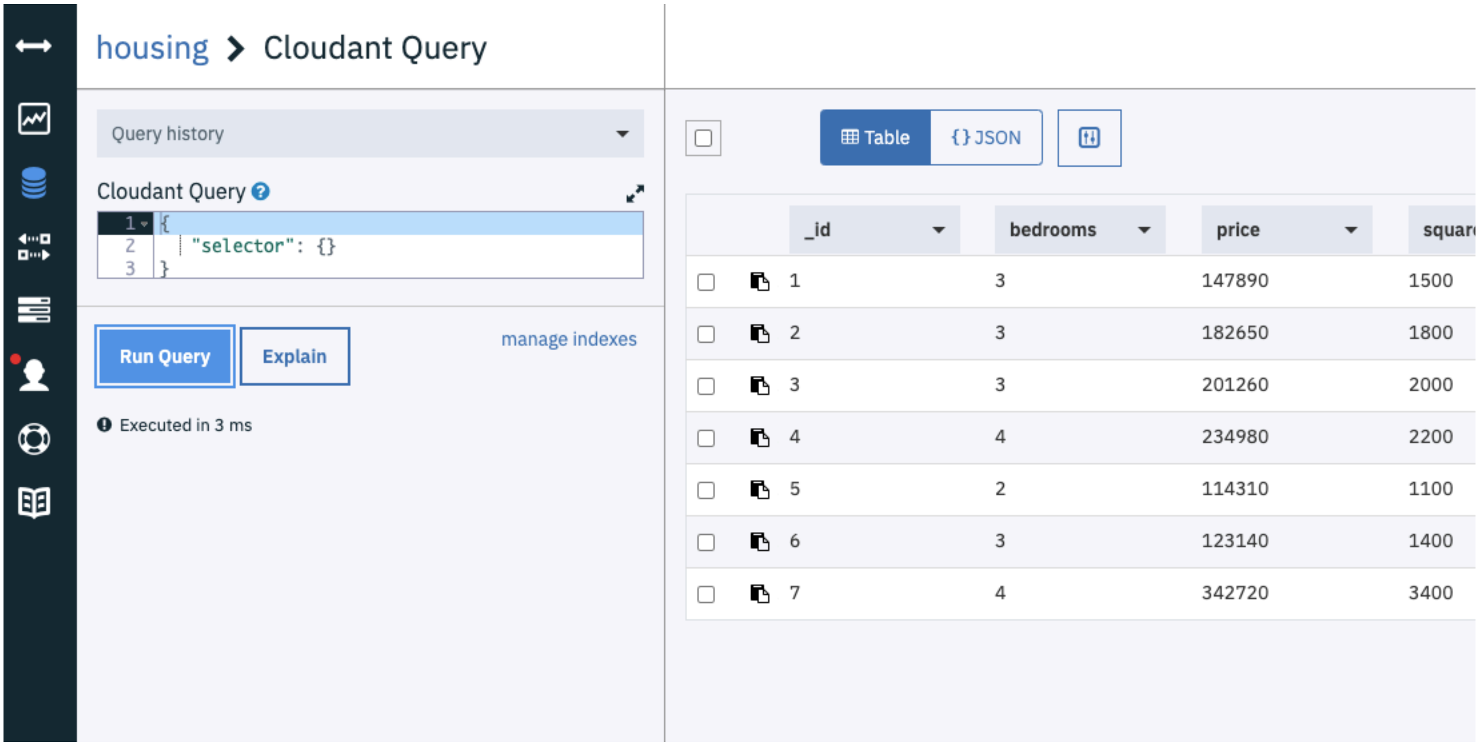


```

{
  "selector": {}
}

```

You should see an output like this.



```
{
  "selector": {}
}
```

Executed in 3 ms

_id	bedrooms	price	squar
1	3	147890	1500
2	3	182650	1800
3	3	201260	2000
4	4	234980	2200
5	2	114310	1100
6	3	123140	1400
7	4	342720	3400

Try out these Cloudant queries.

Select all fields in all documents

```
1
2
3
4
```

```

{
    "selector": {}
}
```

Copied!

Select all fields in all documents with _id greater than 4

```
1
2
3
4
5
6
7
8
```

```

```

```
{
   "selector": {
      "_id": {
         "$gt": "4"
      }
   }
}
```

Copied!

Select all fields in all documents with _id less than 4

```

{
   "selector": {
      "_id": {
         "$lt": "4"
      }
   }
}
```

Copied!

Select the fields _id, square_feet and price in all documents

```

{
   "selector": {},
   "fields": [
      "_id",
      "price",
      "square_feet"
   ]
}
```

Copied!

Select the fields _id, square_feet and price in documents with _id less than 4

```

{
   "selector": {
   "_id": {
         "$lt": "4"
      }
   },
   "fields": [
      "_id",
      "price",
      "square_feet"
   ]
}
```

Copied!

Select the fields _id, bedrooms and price in documents with _id greater than 2 and sort by _id ascending

```

{
   "selector": {
      "_id": {
         "$gt": "2"
      }
   },
   "fields": [
      "_id",
      "price",
      "bedrooms"
   ],
   "sort": [
      {
         "_id": "asc"
      }
   ]
}
```

Copied!

Select the fields _id, bedrooms and price in documents with _id greater than 2 and sort by _id descending

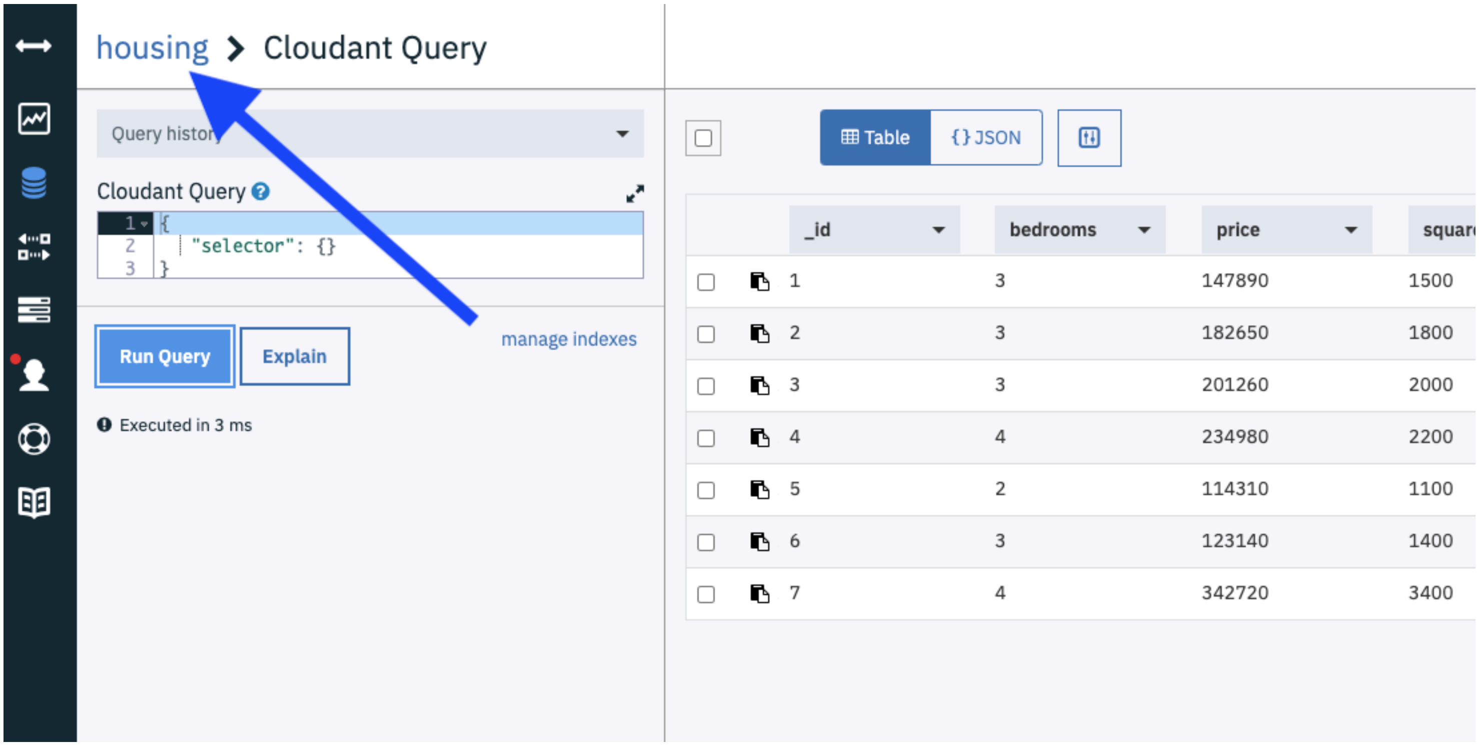
```

{
   "selector": {
      "_id": {
         "$gt": "2"
      }
   },
   "fields": [
      "_id",
      "price",
      "bedrooms"
   ],
   "sort": [
      {
         "_id": "desc"
      }
   ]
}
```

Copied!

Exercise 5 - Update documents

Click on the database name `housing` as shown in the image below.

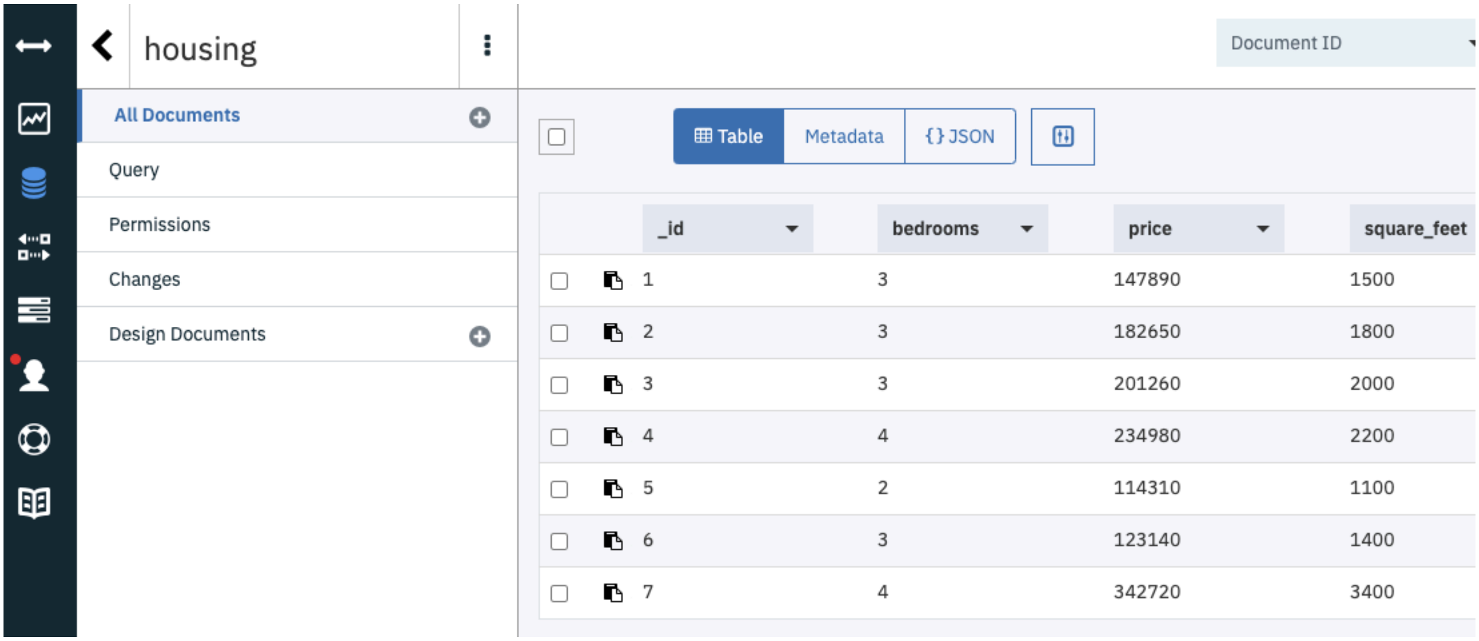


```
{
  "selector": {}
}
```

Executed in 3 ms

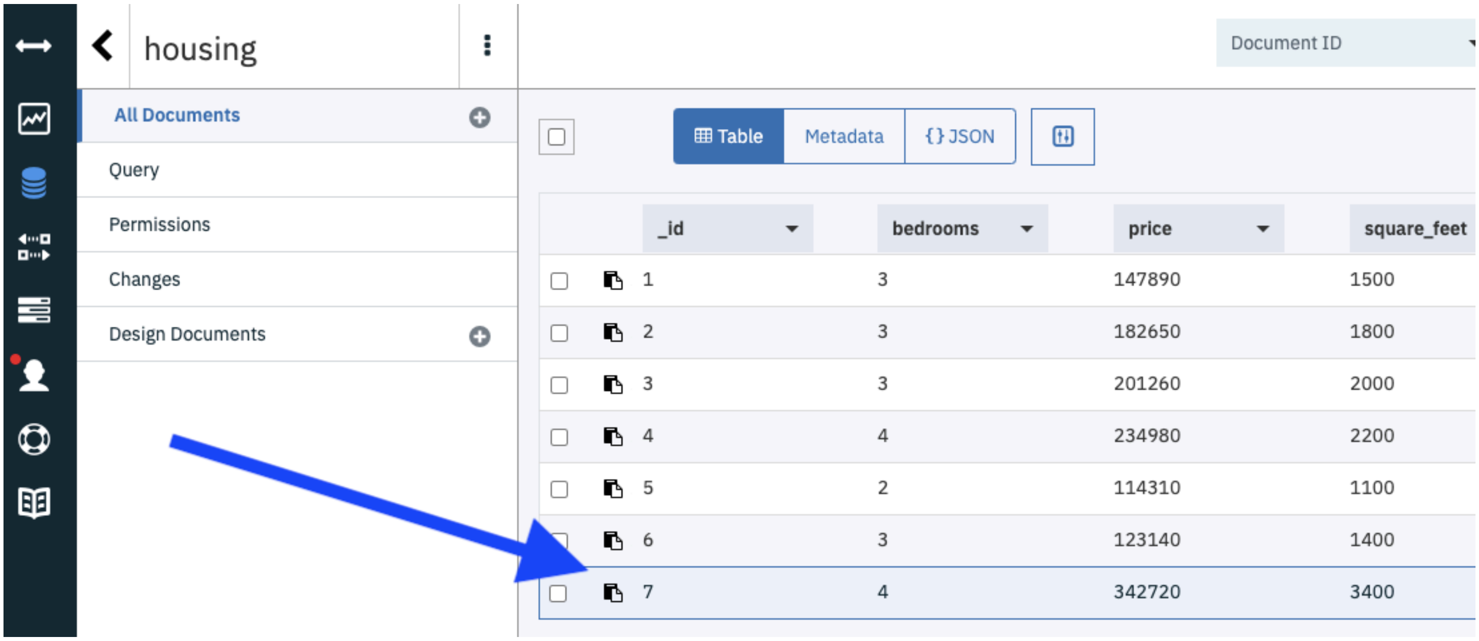
	_id	bedrooms	price	squar
□	1	3	147890	1500
□	2	3	182650	1800
□	3	3	201260	2000
□	4	4	234980	2200
□	5	2	114310	1100
□	6	3	123140	1400
□	7	4	342720	3400

You will see a screen as in the image below.



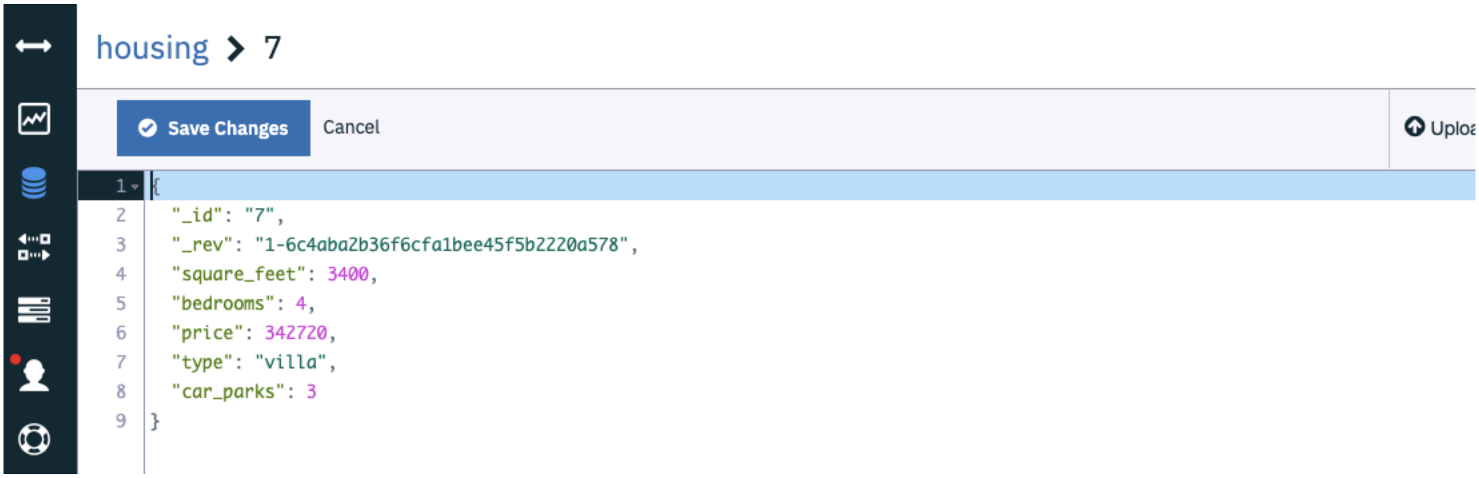
	_id	bedrooms	price	square_feet
□	1	3	147890	1500
□	2	3	182650	1800
□	3	3	201260	2000
□	4	4	234980	2200
□	5	2	114310	1100
□	6	3	123140	1400
□	7	4	342720	3400

Click on the document with _id 7.



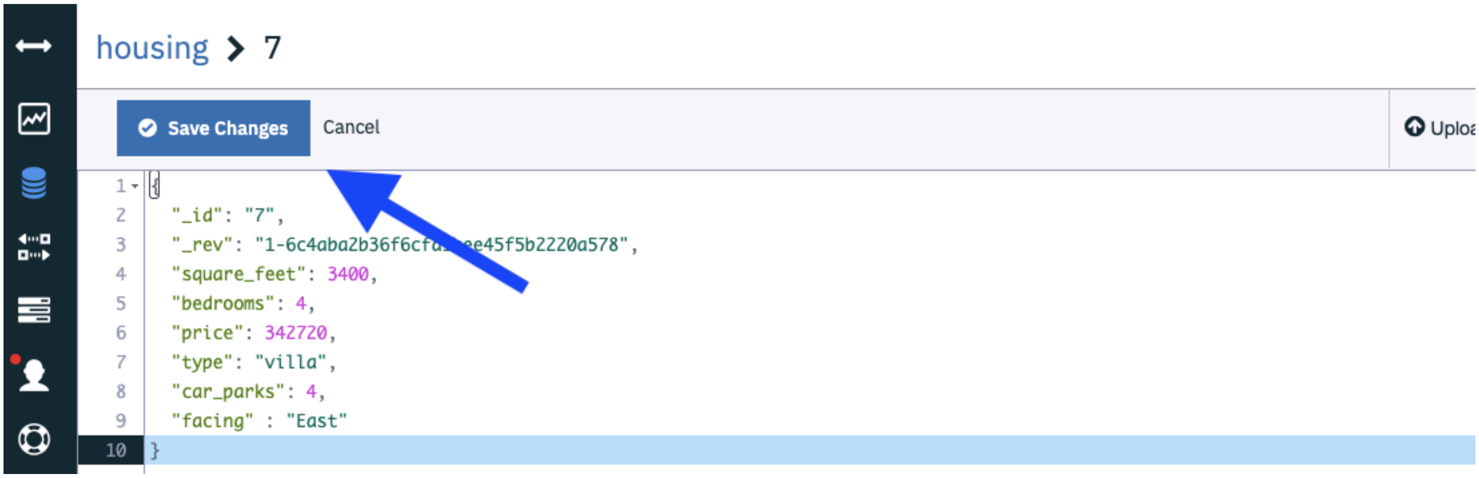
_id	bedrooms	price	square_feet
1	3	147890	1500
2	3	182650	1800
3	3	201260	2000
4	4	234980	2200
5	2	114310	1100
6	3	123140	1400
7	4	342720	3400

The document will open up like this.



```
{
  "_id": "7",
  "_rev": "1-6c4aba2b36f6cfa1bee45f5b2220a578",
  "square_feet": 3400,
  "bedrooms": 4,
  "price": 342720,
  "type": "villa",
  "car_parks": 3
}
```

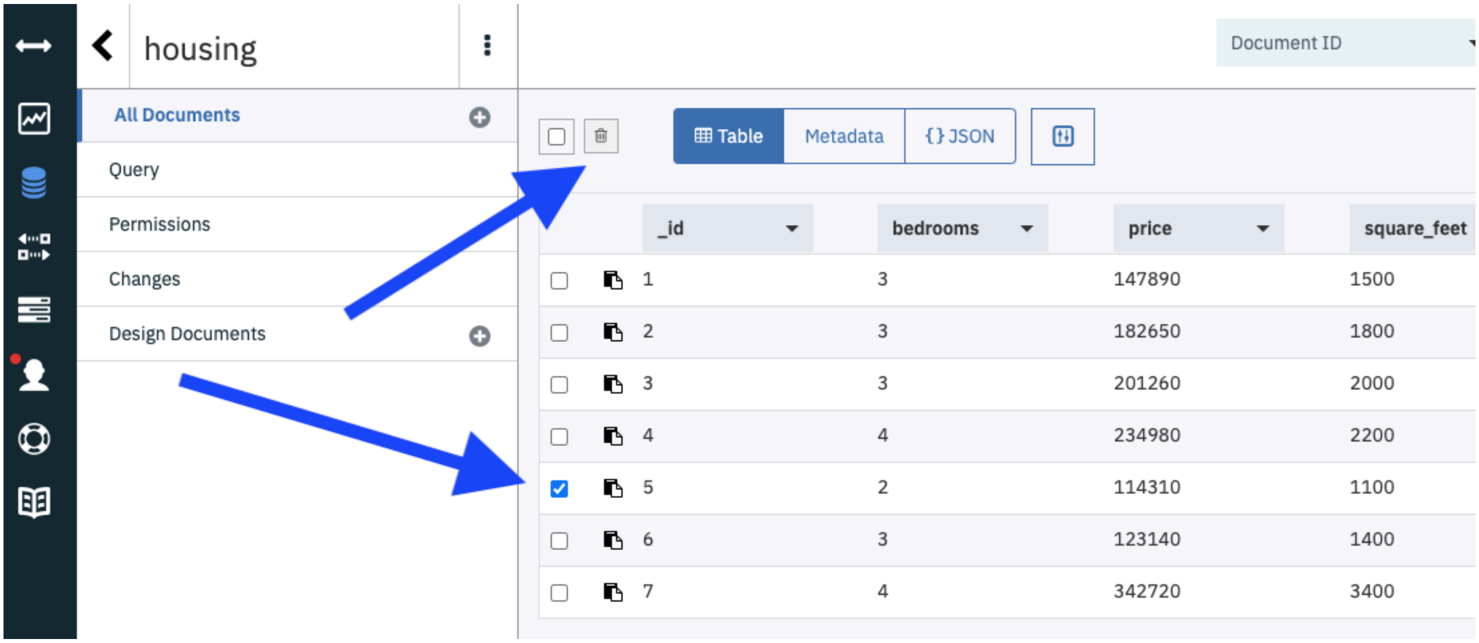
Change the number of `car parks` to 4 and add `facing` key with value `East`, as shown in the image below. Click `Save Changes` to save the document.



```
{
  "_id": "7",
  "_rev": "1-6c4aba2b36f6cfa1bee45f5b2220a578",
  "square_feet": 3400,
  "bedrooms": 4,
  "price": 342720,
  "type": "villa",
  "car_parks": 4,
  "facing" : "East"
}
```

Exercise 6 - Delete documents

Select the document you wish to delete and click on the delete icon as shown in the image below.



		_id	bedrooms	price	square_feet
□		1	3	147890	1500
□		2	3	182650	1800
□		3	3	201260	2000
□		4	4	234980	2200
☑		5	2	114310	1100
□		6	3	123140	1400
□		7	4	342720	3400

You will get a pop up asking "Are you sure you want to delete this doc?"

Click OK.

Practice exercises

1. *Create a database named* ***diamonds****.*

- ▶ Click here for Hint
- ▶ Click here for Solution

2. *Insert the below documents into the* ***diamonds*** *database.*

```
 1. 1
 2. 2
 3. 3
 4. 4
 5. 5
 6. 6
 7. 7
 8. 8
 9. 9
10. 10
11. 11
12. 12
13. 13
14. 14
15. 15
16. 16
17. 17
18. 18
19. 19
20. 20
21. 21
22. 22
23. 23
24. 24
25. 25
26. 26
27. 27
28. 28
29. 29
30. 30
31. 31
32. 32
33. 33
34. 34
35. 35
36. 36
37. 37
38. 38
39. 39
40. 40
41. 41
42. 42
43. 43
44. 44
45. 45
46. 46
47. 47
48. 48
```

```
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110
111
112
113
114
```

```
  {
    "_id": "1",
    "carat": 0.31,
    "cut": "Ideal",
    "color": "J",
    "clarity": "SI2",
    "depth": 62.2,
    "table": 54,
    "price": 339
  }

  {
    "_id": "2",
    "carat": 0.2,
    "cut": "Premium",
    "color": "E",
    "clarity": "SI2",
    "depth": 60.2,
    "table": 62,
    "price": 351

  }

  {
    "_id": "3",
    "carat": 0.32,
    "cut": "Premium",
    "color": "E",
    "clarity": "I1",
    "depth": 60.9,
    "table": 58,
    "price": 342

  }


  {
    "_id": "4",
    "carat": 0.3,
    "cut": "Good",
    "color": "J",
    "clarity": "SI1",
    "depth": 63.4,
    "table": 54,
    "price": 349

  }

  {
    "_id": "5",
    "carat": 0.3,
    "cut": "Good",
    "color": "J",
    "clarity": "SI1",
    "depth": 63.8,
    "table": 56,
    "price": 347

  }

  {
    "_id": "6",
    "carat": 0.3,
    "cut": "Very Good",
    "color": "J",
    "clarity": "SI1",
    "depth": 62.7,
    "table": 59,
    "price": 349
  }

  {
    "_id": "7",
    "carat": 0.3,
    "cut": "Good",
    "color": "I",
    "clarity": "SI2",
    "depth": 63.3,
    "table": 56,
    "price": 343
  }

  {
    "_id": "8",
    "carat": 0.23,
    "cut": "Very Good",
    "color": "E",
    "clarity": "VS2",
    "depth": 63.8,
    "table": 55,
    "price": 339
  }

  {
    "_id": "9",
    "carat": 0.23,
    "cut": "Very Good",
    "color": "H",
    "clarity": "VS1",
    "depth": 61,
    "table": 57,
    "price": 323
  }

  {
    "_id": "10",
    "carat": 0.31,
    "cut": "Very Good",
    "color": "J",
    "clarity": "SI1",
    "depth": 59.4,
    "table": 62,
    "price": 346
  }
```

Copied!

▶ Click here for Hint

▶ Click here for Solution

3. Write a query to fetch all documents

▶ Click here for Hint

▶ Click here for Solution

4. Write a query to fetch all documents with `_id` greater than 2

▶ Click here for Hint

▶ Click here for Solution

5. Write a query to fetch all documents with `_id` less than 4

▶ Click here for Hint

▶ Click here for Solution

6. Set the price of the diamond with `_id` 7 to 352

▶ Click here for Hint

▶ Click here for Solution

7. Delete the document with `_id` 3

▶ Click here for Hint

▶ Click here for Solution

Authors

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