

**This project was created in MongoDB compass.**

**Create a database called OLMS using query**

```
use OLMS;
```

**Create the collections Province, Municipality, Facility, Room, Activity, USES using query**

```
db.createCollection("Province");
```

```
db.createCollection("Municipality");
```

```
db.createCollection("Facility");
```

```
db.createCollection("Room");
```

```
db.createCollection("Activity");
```

```
db.createCollection("USES");
```

**Store records into each collection**

```
//Province Collection
```

```
db.Province.insertMany([
```

```
{
```

```
    provinceCode: 'WC',
```

```
    name: 'Western Cape'
```

```
},
```

```
{
```

```
    provinceCode: 'KZN',
```

```
    name: 'Kwazulu-Natal'
```

```
}
```

```
]);
```

```
//Municipality Collection
```

```
db.Municipality.insertMany([
```

```
{
```

```
    munCode: 'CPT',
```

```
    name: 'City of Cape Town',
```

```
    avgPopulation: 4005016,
```

```
    provinceCode: 'WC'
```

```
},
```

```
{
```

```
    munCode: 'ETH',
```

```
    name: 'eThekweni Metropolitan Municipality',
```

```
    avgPopulation: 3702231,
```

```
    provinceCode: 'KZN'
```

```
}
```

```
]);
```

```
//Facility Collection
```

```
db.Facility.insertMany([
```

```
{
```

```
    facilityId: 'Arts',
```

```
    name: 'Artscape Theatre Centre',
```

```
    address: 'D.F. Malan St, Foreshore, Cape Town, 8001',
```

```
    capacity: 1500,
```

```
    munCode: 'CPT'
```

```
},  
  
{  
    facilityId: 'ICC',  
    name: 'Durban ICC',  
    address: '45 Bram Fischer Rd, Durban Central, Durban, 4001',  
    capacity: 10000,  
    munCode: 'ETH'  
}  
  
]);  
  
//Room Collection  
  
db.Room.insertMany([  
    {  
        roomNo: 1,  
        description: 'Hall 1',  
        facilityId: 'Arts'  
    },  
    {  
        roomNo: 2,  
        description: 'Hall 2',  
        facilityId: 'ICC'  
    }  
]);  
  
//Activity Collection  
  
db.Activity.insertMany([
```

```

{
    activityRef: 'MUS01',
    name: 'Music Concert'
},
{
    activityRef: 'EXH01',
    name: 'Art Exhibition'
}
]);

//Uses Collection

db.USES.insertMany([
{
    facilityId: 'Arts',
    activityRef: 'MUS01',
    Date: new ISODate('2025-05-20')
},
{
    facilityId: 'ICC',
    activityRef: 'EXH01',
    Date: new ISODate('2025-06-15')
}
]);

```

**Write a query to retrieve and display the name of a facility such as “Arts” and all the related rooms associated with the facility**

```

db.Facility.aggregate([
{
    //The match command is used to find the facilityId that equals 'Arts'
    $match: {facilityId: 'Arts'}
},
{
    //The lookup command is used to create a connection to the Room Collection
    $lookup:
    {
        from: 'Room',
        localField: 'facilityId',
        foreignField: 'facilityId',
        as: 'rooms'
    }
},
{
    //The project command is used to project a specific output.
    $project:
    {
        _id: 1,
        facilityId: 1,
        name: 1,
        capacity: 1,
        address: 1,
        munCode: 1,
    }
}
])

```



```

    $project: {
        _id: '$munCode',
        name: 1,
        avgPopulation: 1,
        provinceCode: 1
    }
}
]);

```

**Retrieve and display the date on which a facility is used, the details of the facility including facility identity, name, capacity and address.**

```

db.Facility.aggregate([
{
    //Create connection to the USES Collection
    $lookup:
    {
        from: 'USES',
        localField: 'facilityId',
        foreignField: 'facilityId',
        as: 'uses'
    }
},
{
    //Unwind is used to deconstruct the array of the use's collections data. It is
    necessary to match the output provided in the image.

```

```

        $unwind: '$uses'
    },
    {
        //To get custom output
        $project:
        {
            _id: 0,
            useDate: '$uses.Date',
            facilityId: 1,
            facilityName: '$name',
            capacity: 1,
            address: 1
        }
    }
]);

```

**Write a query to retrieve and display a list of activities including activity reference codes, activity name along with the date on which each activity takes place as well as detailed information regarding the facility such as the facility identity, facility name, capacity and address of each facility. In addition, the municipalities and province in which the facility are situated should be displayed with other requested information.**

```

db.USES.aggregate([
{
    //Create connection to the activity collection
    $lookup:

```



```
{  
    from: 'Activity',  
    localField: 'activityRef',  
    foreignField: 'activityRef',  
    as: 'activity'  
}
```

```
},
```

```
{
```

//Unwind is used to deconstruct the array of the activity's collections data. It is necessary to match the output provided in the image.

```
$unwind: '$activity'
```

```
},
```

```
{
```

//Create connection to the Facility Collection

```
$lookup:
```

```
{  
    from: 'Facility',  
    localField: 'facilityId',  
    foreignField: 'facilityId',  
    as: 'facility'  
}
```

```
},
```

```
{
```

//Unwind is used to deconstruct the array of the facility's collections data. It is necessary to match the output provided in the image.

```
$unwind: '$facility'

},

{

    //Create connection to the Municipality Collection

    $lookup:

    {

        from: 'Municipality',

        localField: 'facility.munCode',

        foreignField: 'munCode',

        as: 'municipality'

    }

},
```

```
{

    //Unwind is used to deconstruct the array of the activity's collections data. It is
    necessary to match the output provided in the image.
```

```
    $unwind: '$municipality'

},

{

    //Create connection to the Province Collection

    $lookup:

    {

        from: 'Province',

        localField: 'municipality.provinceCode',

        foreignField: 'provinceCode',

        as: 'province'
```

```
    }  
  },  
  {
```

//Unwind is used to deconstruct the array of the province's collections data. It is necessary to match the output provided in the image.

```
    $unwind: '$province'  
  },  
  {
```

//To get custom output

```
    $project:  
    {  
      _id: 0,  
      useDate: '$Date',  
      activityRef: 1,  
      activityName: '$activity.name',  
      facilityId: 1,  
      facilityName: '$facility.name',  
      capacity: '$facility.capacity',  
      address: '$facility.address',  
      municipality: '$municipality.name',  
      province: '$province.name'  
    }  
  }  
];
```