Dataproc - Spark ML

- Dataproc은 일괄 처리, 쿼리, 스트리밍, 머신 러닝에 오픈소스 데이터 도구를 활용할 수 있는 관리형 Spark 및 Hadoop 서비스입니다. Dataproc 자동화를 통해 신속하게 클러스터를 만들고 손쉽게 관리하며 불필요한 클러스터를 사용 중지하여 비용을 절감할 수 있습니다. 관리 시간과 비용이 절감되므로 작업과 데이터에 집중할 수 있습니다.
  - Created a fully-managed Cloud SQL instance for rentals
  - Created tables and explored the schema with SQL
  - Ingested data from CSVs
  - Edited and ran a Spark ML job on Dataproc
  - Viewed prediction results

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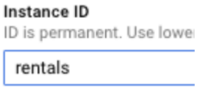
1. Create a Cloud SQL instance

1. In the Google Cloud Console, Select **Navigation menu > SQL** (in the Databases section).
2. Click **Create instance**.
3. Click **Choose MySQL**.
4. For **Instance ID**, type **rentals**.



2. Create tables

```
CREATE DATABASE IF NOT EXISTS recommendation_spark;

USE recommendation_spark;

DROP TABLE IF EXISTS Recommendation;
DROP TABLE IF EXISTS Rating;
DROP TABLE IF EXISTS Accommodation;

CREATE TABLE IF NOT EXISTS Accommodation
(
  id varchar(255),
  title varchar(255),
  location varchar(255),
  price int,
  rooms int,
  rating float,
  type varchar(255),
  PRIMARY KEY (ID)
);

CREATE TABLE  IF NOT EXISTS Rating
(
  userId varchar(255),
  accoId varchar(255),
  rating int,
  PRIMARY KEY(accoId, userId),
  FOREIGN KEY (accoId)
    REFERENCES Accommodation(id)
);

CREATE TABLE  IF NOT EXISTS Recommendation
(
  userId varchar(255),
  accoId varchar(255),
```

```
  prediction float,
  PRIMARY KEY(userId, accoId),
  FOREIGN KEY (accoId)
    REFERENCES Accommodation(id)
);

SHOW DATABASES;
```

3. Stage Data

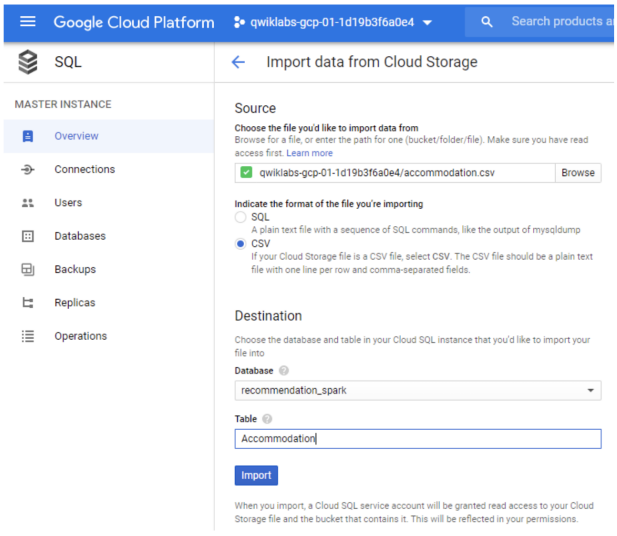
1. Option 1: Use the command line

```
echo "Creating bucket: gs://$DEVSHELL_PROJECT_ID"
gsutil mb gs://$DEVSHELL_PROJECT_ID

echo "Copying data to our storage from public dataset"
gsutil cp gs://cloud-training/bdml/v2.0/data/accommodation.csv gs://$DEVSHELL_PROJECT_ID
gsutil cp gs://cloud-training/bdml/v2.0/data/rating.csv gs://$DEVSHELL_PROJECT_ID

echo "Show the files in our bucket"
gsutil ls gs://$DEVSHELL_PROJECT_ID

echo "View some sample data"
gsutil cat gs://$DEVSHELL_PROJECT_ID/accommodation.csv
```

2. Option 2: Use the Cloud Console UI
   a. Navigate to **Storage** and select **Cloud Storage > Browser**.
   b. Click **Create Bucket** (if one does not already exist).
   c. Specify your project name as the bucket name.
   d. Click **Create**.
   e. Download the below files locally and then upload them inside of your new bucket

4. Load data from Cloud Storage into Cloud SQL tables

- 콘솔의 SQL로 이동해서 import를 통해서 accommodation, ratings load



5. Explore Cloud SQL data

6. Launch Dataproc

1. SQL에서 Dataproc API 허용
2. cluster 생성
3. Master/Workers 노드 생성

```
echo "Authorizing Cloud Dataproc to connect with Cloud SQL"
CLUSTER=rentals
CLOUDSQL=rentals
ZONE=us-central1-c
NWORKERS=2

machines="$CLUSTER-m"
for w in `seq 0 $(($NWORKERS - 1))`; do
   machines="$machines $CLUSTER-w-$w"
done

echo "Machines to authorize: $machines in $ZONE ... finding their IP addresses"
ips=""
for machine in $machines; do
    IP_ADDRESS=$(gcloud compute instances describe $machine --zone=$ZONE --format='value(networkInterfaces.accessConfigs[].natIP)' | sed "s
    echo "IP address of $machine is $IP_ADDRESS"
    if [ -z  $ips ]; then
       ips=$IP_ADDRESS
    else
       ips="$ips,$IP_ADDRESS"
    fi
done

echo "Authorizing [$ips] to access cloudsql=$CLOUDSQL"
gcloud sql instances patch $CLOUDSQL --authorized-networks $ips
```

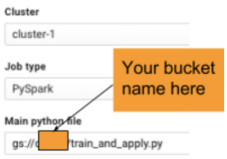
4. SQL Public IP copy

7. Run the ML model

```
gsutil cp gs://cloud-training/bdml/v2.0/model/train_and_apply.py train_and_apply.py
cloudshell edit train_and_apply.py
```

8. Run your ML job on Dataproc

1. Submit Job



9. Explore inserted rows with SQL