BigQuery - running queries

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Google Cloud Project: bdcc-project-201603999

Link to the TensorFlow using autoML :
https://console.cloud.google.com/vision/datasets/ICN4973518252698238976;modelId=I CN1129556882516606976/predict?project=bdcc-project-201603999&supportedpurview=project APP Engine : https://bdcc-project-201603999.oa.r.appspot.com/

Get access to Google Cloud from the notebook

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly
remount, call drive.mount("/content/drive", force_remount=True).
```

Set project id

```
PROJECT_ID='bdcc-project-201603999' #@param {type: "string"}
```

Authenticate

```
from google.colab import auth
auth.authenticate_user()
#!gcloud config set project {PROJECT_ID}
```

/image_search_multiple

Na query "image search multiple" são feitas junções das tabelas Classes e Labels usando o Label como elemento em comum, foi também usado o UNNEST para podermos criar um array com elesmentos a ter em conta no where. No select usamos o ARRAY_AGG de forma a conseguirmos obter um conjunto de elementos.

```
%%bigquery --project $PROJECT_ID


SELECT image.ImageId, ARRAY_AGG(classes.Description) as classes
FROM `bdcc22project.openimages.classes` as classes
JOIN `bdcc22project.openimages.image_labels` as image USING(Label),
UNNEST(["Dog", "Cat"]) as animals
WHERE classes.description like animals
GROUP BY 1 order by array_length(classes) desc limit 10
```

```
        ImageId        classes
0  60ddbb1c45154865  [Cat, Dog]
1  c0303c533156ff7c  [Cat, Dog]
2  93a33e91cf0f5486  [Cat, Dog]
3  0ff037d4305d0f10  [Cat, Dog]
4  a801eed54a988ca1  [Cat, Dog]
5  d5a19e615dc779ef  [Cat, Dog]
6  ce26d0f13deb5842  [Cat, Dog]
7  00d9419e2faa59fa       [Cat]
8  017c776a67956dd9       [Cat]
9  018376cd9ec14643       [Cat]
```

/relations

Na query "relations" são feitas junções de tres tabelas (classes,relations,tester) usando como elemento comum as labels mas tendo em conta a sua associação com cada tabela.

```
%%bigquery --project $PROJECT_ID

SELECT relations.Relation, COUNT(*) AS NumImages
        FROM `bdcc22project.openimages.classes` as classes
        JOIN `bdcc22project.openimages.relations` as relations ON
relations.label1 = classes.label
        LEFT JOIN `bdcc22project.openimages.classes` as tester ON
tester.Label = relations.Label2
        GROUP BY Relation
        ORDER BY Relation
```

```
        Relation  NumImages
0             at        861
1           hits         54
2          holds        658
3      inside_of        161
4  interacts_with        272
5             on        550
6          plays        175
7          under          3
8          wears         34
```

/relations_search

Na query "relations search" são feitas junções de tres tabelas (classes,relations,tester) como na query anterior e usando como elemento comum as labels mas tendo em conta a sua associação com cada tabela.

```
%%bigquery --project $PROJECT_ID
SELECT relations.ImageId, classes.Description, relations.Relation,
tester.Description
```

```
              FROM `bdcc22project.openimages.classes` as classes
              JOIN `bdcc22project.openimages.relations` as relations
ON relations.label1 = classes.label
              LEFT JOIN `bdcc22project.openimages.classes` as tester
ON tester.Label = relations.Label2
              WHERE relations.Relation LIKE 'plays'
              and classes.Description LIKE 'Girl'
              and tester.Description LIKE 'Violin'
              order by 1
              limit 10
```

```
          ImageId Description Relation Description_1
0  0041c772f8b9aef6        Girl     plays        Violin
1  708228e99ab1429c        Girl     plays        Violin
2  72a9928a7e27d7a8        Girl     plays        Violin
3  82c39a4b066fe331        Girl     plays        Violin
4  8dc418a8b5d412a5        Girl     plays        Violin
5  b8a69b4b027a98c1        Girl     plays        Violin
6  e0bc92015fe1a21c        Girl     plays        Violin
7  e563022367b0fe06        Girl     plays        Violin
```

/image_info

Na query "Image Info" são feitas as junçoes de duas tabelas (classes e labels) usando label como referência.

```
%%bigquery --project $PROJECT_ID
SELECT Description
        FROM `bdcc22project.openimages.classes`
        JOIN `bdcc22project.openimages.image_labels` USING(Label)
        WHERE ImageId = '0041c772f8b9aef6'
        ORDER BY Description
```

```
    Description
0      Clothing
1          Girl
2     Human eye
3    Human hair
4    Human hand
5   Human mouth
6    Human nose
7        Violin
```