Trabalho1

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#

Instituto Federal de Educação, Ciência e Tecnologia

####

Câmpus Câmpinas

####

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Introdução

Este é um conjunto de dados dos Jogos Olímpicos que descreve medalhas e atletas para Tóquio 2020. Os dados foram criados a partir dos Jogos Olímpicos de Tóquio .

Mais de 2.400 medalhas e 11.000 atletas (com alguns dados pessoais: data e local de nascimento, altura, etc.) dos XXXII Jogos Olímpicos você pode encontrar aqui. Além disso, estão presentes treinadores e responsáveis técnicos.

Dados:

medals_total.csv- conjunto de dados que contém todas as medalhas agrupadas por país.

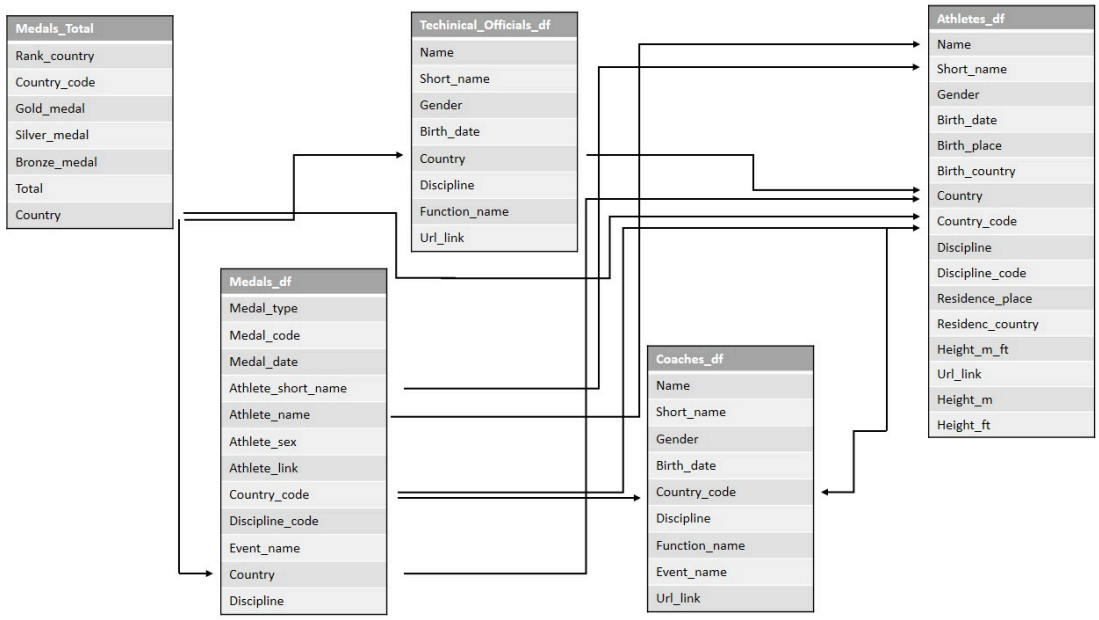
medals.csv - conjunto de dados que inclui informações gerais sobre todos os atletas que ganharam uma medalha.

athletes.csv - conjunto de dados que inclui algumas informações pessoais de todos os atletas.

coaches.csv - o conjunto de dados que inclui algumas informações pessoais de todos os treinadores.

technical_officials - o conjunto de dados que inclui algumas informações pessoais de todos os funcionários técnicos.

O relacionamento entre as tabelas se dá conforme imagem abaixo:



Conexão com a instância AWS e criação do database

[255]:
```
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[2]:
```
#!pip install imdb-sqlite
#import sqlite3
```

[3]:
```
x = {}
for dirname, _, filenames in os.walk('/home/amanda/Documentos/Trabalho1_TBD/
 ↪DatabaseOlympic'):
    for filename in filenames:
        x[filename.split ('.')[0]+'_df'] = os.path.join(dirname, filename)
```

[4]:
```
for i in x.keys():
    print(i)
    locals()[i] = pd.read_csv(x[i])
    locals()[i].columns = [w.replace('/', '_') for w in locals()[i].columns]
    locals()[i].columns = [w.replace(' ', '_') for w in locals()[i].columns]
    locals()[i].columns = [w.lower() for w in locals()[i].columns]
```

```
medals_total_df
coaches_df
technical_officials_df
athletes_df
medals_df
```

[5]:
```
#db instance : databasetrabalho1
#username: natalia
#pass: Amanda0203
#host: databasetrabalho1.ctwhhho2wipa.sa-east-1.rds.amazonaws.com
#port: 3306
```

[443]:
```
db = pymysql.connect(host = 'databasetrabalho1.ctwhhho2wipa.sa-east-1.rds.
↪amazonaws.com', user = 'natalia', password = 'xxxx')
```

[444]:
```
cursor = db.cursor()
```

[10]:
```
cursor
```

[10]:
```
<pymysql.cursors.Cursor at 0x7fd7b965b460>
```

[11]:
```
sql = '''drop database jogos'''
cursor.execute(sql)
```

[11]:
```
5
```

[12]:
```
sql = '''create database jogos'''
cursor.execute(sql)
```

[12]:
```
1
```

[445]:
```
sql = '''use jogos'''
cursor.execute(sql)
```

[445]:
```
0
```

[14]:
```
cursor.connection.commit()
```

[15]:
```
for i in x.keys():
    j = i.replace("_df", "_columns")
    print(j)
    locals()[j] = list(locals()[i].columns)
```

```
medals_total_columns
coaches_columns
technical_officials_columns
athletes_columns
medals_columns
```

[424]:
```
print(medals_total_columns)
print(coaches_columns)
print(technical_officials_columns)
print(athletes_columns)
```

```
print(medals_columns)
```

```
['rank', 'country_code', 'gold_medal', 'silver_medal', 'bronze_medal', 'total',
'country']
['name', 'short_name', 'gender', 'birth_date', 'country_code', 'discipline',
'function', 'event', 'url']
['name', 'short_name', 'gender', 'birth_date', 'country', 'discipline',
'function', 'url']
['name', 'short_name', 'gender', 'birth_date', 'birth_place', 'birth_country',
'country', 'country_code', 'discipline', 'discipline_code', 'residence_place',
'residence_country', 'height_m_ft', 'url']
['medal_type', 'medal_code', 'medal_date', 'athlete_short_name', 'athlete_name',
'athlete_sex', 'athlete_link', 'country_code', 'discipline_code', 'event',
'country', 'discipline']
```

Medals_total_df

[17]:
```
print(medals_total_df.head(5))
print(medals_total_df.info())
```

```
   rank country_code  gold_medal  silver_medal  bronze_medal  total  \
0     1          USA          39            41            33    113
1     2          CHN          38            32            18     88
2     3          JPN          27            14            17     58
3     4          GBR          22            21            22     65
4     5          ROC          20            28            23     71

                      country
0    United States of America
1  People's Republic of China
2                       Japan
3               Great Britain
4                         ROC
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 93 entries, 0 to 92
Data columns (total 7 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   rank          93 non-null     int64
 1   country_code  93 non-null     object
 2   gold_medal    93 non-null     int64
 3   silver_medal  93 non-null     int64
 4   bronze_medal  93 non-null     int64
 5   total         93 non-null     int64
 6   country       93 non-null     object
dtypes: int64(5), object(2)
memory usage: 5.2+ KB
None
```

[18]:
```
sql = '''CREATE TABLE medals_total_df (
    rank_country INT,
    country_code VARCHAR(10),
    gold_medal INT,
    silver_medal INT,
    bronze_medal INT,
    total INT,
    country VARCHAR(100))'''
```

[19]:
```
sql
cursor.execute(sql)
```

[19]: 0

[20]:
```
cursor.connection.commit()
```

[21]:
```
cursor.execute('''SELECT * FROM medals_total_df''')
```

[21]: 0

[22]:
```
for i,row in medals_total_df.iterrows():
    #here %S means string values
    sql = "INSERT INTO jogos.medals_total_df VALUES (%s,%s,%s,%s,%s,%s,%s)"
    cursor.execute(sql, tuple(row))
```

[23]:
```
cursor.connection.commit()
```

[24]:
```
cursor.execute('''SELECT * FROM medals_total_df''')
```

[24]: 93

Coaches_df

[25]:
```
print(coaches_df.info())
print(coaches_df.head(5))
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 407 entries, 0 to 406
Data columns (total 9 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   name          407 non-null    object
 1   short_name    407 non-null    object
 2   gender        407 non-null    object
 3   birth_date    407 non-null    object
 4   country_code  407 non-null    object
 5   discipline    407 non-null    object
 6   function      407 non-null    object
```

```
 7   event          281 non-null    object
 8   url            407 non-null    object
dtypes: object(9)
memory usage: 28.7+ KB
None
```

```
               name    short_name gender  birth_date country_code  discipline  \
0  ABDELMAGID Wael  ABDELMAGID W   Male  1982-08-02          EGY    Football
1        ABE Junya         ABE J   Male  1990-07-25          JPN  Volleyball
2    ABE Katsuhiko         ABE K   Male  1979-09-23          JPN  Basketball
3     ADAMA Cherif       ADAMA C   Male  1962-05-06          CIV    Football
4       AGEBA Yuya       AGEBA Y   Male  1983-09-30          JPN  Volleyball

     function event                                                 url
0  Head Coach   NaN  ../../../en/results/football/athlete-profile-n…
1  Head Coach   NaN  ../../../en/results/volleyball/athlete-profile…
2       Coach   NaN  ../../../en/results/basketball/athlete-profile…
3  Head Coach   NaN  ../../../en/results/football/athlete-profile-n…
4  Head Coach   NaN  ../../../en/results/volleyball/athlete-profile…
```

[26]:
```
sql = '''CREATE TABLE coaches_df (
 name VARCHAR(100)
 ,short_name VARCHAR(100)
 ,gender VARCHAR(10)
 ,birth_date DATE
 ,country_code VARCHAR(10)
 ,discipline VARCHAR(100)
 ,function_name VARCHAR(50)
 ,event_name VARCHAR(10)
 ,url_link VARCHAR(100))'''
```

[27]:
```
sql
cursor.execute(sql)
```

[27]:
```
0
```

[28]:
```
cursor.connection.commit()
```

[29]:
```
coaches_df = coaches_df.where(pd.notnull(coaches_df), None)
```

[30]:
```
for i,row in coaches_df.iterrows():
    #here %S means string values
    sql = "INSERT INTO jogos.coaches_df VALUES (%s,%s,%s,%s,%s,%s,%s,%s,%s)"
    cursor.execute(sql, tuple(row))
```

[31]:
```
cursor.execute('''SELECT * FROM coaches_df''')
```

[31]:
```
407
```

Technical_officials_df

[32]:
```
print(technical_officials_df.info())
print(technical_officials_df.head(5))
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 956 entries, 0 to 955
Data columns (total 8 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   name        956 non-null    object
 1   short_name  956 non-null    object
 2   gender      956 non-null    object
 3   birth_date  956 non-null    object
 4   country     956 non-null    object
 5   discipline  956 non-null    object
 6   function    956 non-null    object
 7   url         956 non-null    object
dtypes: object(8)
memory usage: 59.9+ KB
None
                         name     short_name  gender  birth_date     country  \
0                ABAEVA Elena       ABAEVA E  Female  1966-04-21  Uzbekistan
1                ABBAR Bachir        ABBAR B    Male  1965-05-03     Morocco
2         ABDELLATIF Makfouni   ABDELLATIF M    Male  1972-11-23     Morocco
3                   ABE Miya          ABE M  Female  1992-10-27       Japan
4  ACIGA FULA Antonio Stephen  ACIGA FULA AS    Male  1957-11-28      Uganda

         discipline function  \
0         Wrestling    Judge
1            Boxing    Judge
2            Boxing    Judge
3  Beach Volleyball  Referee
4            Boxing    Judge

                                                 url
0  ../../../en/results/wrestling/athlete-profile-…
1  ../../../en/results/boxing/athlete-profile-n15…
2  ../../../en/results/boxing/athlete-profile-n15…
3  ../../../en/results/beach-volleyball/athlete-p…
4  ../../../en/results/boxing/athlete-profile-n15…
```

[33]:
```
sql = '''CREATE TABLE technical_officials_df (
 name VARCHAR(100)
 ,short_name VARCHAR(100)
 ,gender VARCHAR(10)
 ,birth_date DATE
 ,country VARCHAR(10)
```

```
 ,discipline VARCHAR(100)
 ,function_name VARCHAR(50)
 ,url_link VARCHAR(100))'''
```

[34]:
```
sql
cursor.execute(sql)
```

[34]: 0

[35]:
```
cursor.connection.commit()
```

[36]:
```
cursor.execute('''SELECT * FROM technical_officials_df''')
```

[36]: 0

[37]:
```
for i,row in technical_officials_df.iterrows():
    #here %S means string values
    sql = "INSERT INTO jogos.technical_officials_df VALUES␣
 ↪(%s,%s,%s,%s,%s,%s,%s,%s)"
    cursor.execute(sql, tuple(row))
```

[38]:
```
cursor.connection.commit()
```

[88]:
```
cursor.execute('''SELECT * FROM technical_officials_df''')
```

[88]: 956

Athletes_df

[40]:
```
print(athletes_df.info())
print(athletes_df.head(5))
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11656 entries, 0 to 11655
Data columns (total 14 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   name               11656 non-null  object
 1   short_name         11656 non-null  object
 2   gender             11497 non-null  object
 3   birth_date         11497 non-null  object
 4   birth_place        7608 non-null   object
 5   birth_country      8320 non-null   object
 6   country            11656 non-null  object
 7   country_code       11656 non-null  object
 8   discipline         11497 non-null  object
 9   discipline_code    11656 non-null  object
 10  residence_place    7249 non-null   object
```

```
 11  residence_country  6545 non-null   object
 12  height_m_ft        4655 non-null   object
 13  url                11656 non-null  object
dtypes: object(14)
memory usage: 1.2+ MB
None
                name  short_name  gender  birth_date birth_place  \
0    AALERUD Katrine   AALERUD K  Female  1994-12-04      VESTBY
1        ABAD Nestor      ABAD N    Male  1993-03-29       ALCOI
2  ABAGNALE Giovanni  ABAGNALE G    Male  1995-01-11    GRAGNANO
3     ABALDE Alberto    ABALDE A    Male  1995-12-15      FERROL
4      ABALDE Tamara    ABALDE T  Female  1989-02-06        VIGO

  birth_country country country_code           discipline discipline_code  \
0        Norway  Norway          NOR         Cycling Road             CRD
1         Spain   Spain          ESP  Artistic Gymnastics             GAR
2         Italy   Italy          ITA               Rowing             ROW
3         Spain   Spain          ESP           Basketball             BKB
4         Spain   Spain          ESP           Basketball             BKB

  residence_place residence_country height_m_ft  \
0             NaN               NaN         NaN
1          MADRID             Spain  1.65/5'4''
2        SABAUDIA             Italy  1.98/6'5''
3             NaN               NaN  2.00/6'6''
4             NaN               NaN  1.92/6'3''

                                              url
0  ../../../en/results/cycling-road/athlete-profi…
1  ../../../en/results/artistic-gymnastics/athlet…
2  ../../../en/results/rowing/athlete-profile-n13…
3  ../../../en/results/basketball/athlete-profile…
4  ../../../en/results/basketball/athlete-profile…
```

[41]:
```
athletes_df = athletes_df.where(pd.notnull(athletes_df), None)
```

[42]:
```
x = athletes_df['height_m_ft'].str.split('/',expand=True)
x.replace(np.nan, None)
athletes_df[['height_m','height_ft']] = x
```

[43]:
```
athletes_df
```

[43]:
```
                    name   short_name  gender  birth_date  birth_place  \
0          AALERUD Katrine    AALERUD K  Female  1994-12-04       VESTBY
1              ABAD Nestor       ABAD N    Male  1993-03-29        ALCOI
2        ABAGNALE Giovanni   ABAGNALE G    Male  1995-01-11     GRAGNANO
3           ABALDE Alberto     ABALDE A    Male  1995-12-15       FERROL
```

```
4              ABALDE Tamara     ABALDE T  Female  1989-02-06         VIGO
…                        …          …     …          …           …
11651  ZWICKER Martin Detlef   ZWICKER MD    Male  1987-02-27       KOTHEN
11652      ZWOLINSKA Klaudia  ZWOLINSKA K  Female  1998-12-18         None
11653           ZYKOVA Yulia     ZYKOVA Y  Female  1995-11-25  KRASNOYARSK
11654      ZYUZINA Ekaterina    ZYUZINA E  Female  1996-12-08      LIPETSK
11655        ZYZANSKA Sylwia   ZYZANSKA S  Female  1997-07-27         None

            birth_country  country country_code           discipline  \
0                  Norway   Norway          NOR         Cycling Road
1                   Spain    Spain          ESP  Artistic Gymnastics
2                   Italy    Italy          ITA               Rowing
3                   Spain    Spain          ESP           Basketball
4                   Spain    Spain          ESP           Basketball
…                       …      …           …                   …
11651             Germany  Germany          GER               Hockey
11652                None   Poland          POL         Canoe Slalom
11653  Russian Federation      ROC          ROC             Shooting
11654  Russian Federation      ROC          ROC              Sailing
11655                None   Poland          POL              Archery

      discipline_code residence_place   residence_country height_m_ft  \
0                 CRD            None                None        None
1                 GAR          MADRID               Spain  1.65/5'4''
2                 ROW       SABAUDIA               Italy  1.98/6'5''
3                 BKB            None                None  2.00/6'6''
4                 BKB            None                None  1.92/6'3''
…                   …               …                   …          …
11651             HOC            None                None  1.76/5'9''
11652             CSL       NOWY SACZ              Poland        None
11653             SHO     KRASNOYARSK  Russian Federation        None
11654             SAL         LIPETSK  Russian Federation        None
11655             ARC            None                None        None

                                                    url height_m height_ft
0      ../../../en/results/cycling-road/athlete-profi…     None      None
1      ../../../en/results/artistic-gymnastics/athlet…     1.65     5'4''
2      ../../../en/results/rowing/athlete-profile-n13…     1.98     6'5''
3      ../../../en/results/basketball/athlete-profile…     2.00     6'6''
4      ../../../en/results/basketball/athlete-profile…     1.92     6'3''
…                                                    …       …       …
11651  ../../../en/results/hockey/athlete-profile-n13…     1.76     5'9''
11652  ../../../en/results/canoe-slalom/athlete-profi…     None      None
11653  ../../../en/results/shooting/athlete-profile-n…     None      None
11654  ../../../en/results/sailing/athlete-profile-n1…     None      None
11655  ../../../en/results/archery/athlete-profile-n1…     None      None
```

```
[11656 rows x 16 columns]
```

[44]:
```
sql = '''CREATE TABLE athletes_df (
 name VARCHAR(100)
 ,short_name VARCHAR(100)
 ,gender VARCHAR(10)
 ,birth_date DATE
 ,birth_place VARCHAR(100)
 ,birth_country VARCHAR(100)
 ,country VARCHAR(100)
 ,country_code VARCHAR(10)
 ,discipline VARCHAR(100)
 ,discipline_code VARCHAR(100)
 ,residence_place VARCHAR(100)
 ,residence_country VARCHAR(100)
 ,height_m_ft VARCHAR(100)
 ,url_link VARCHAR(100)
 ,height_m DECIMAL(3,2)
 ,height_ft VARCHAR(10))'''
```

[45]:
```
sql
cursor.execute(sql)
```

[45]:
```
0
```

[46]:
```
cursor.execute('''SELECT * FROM athletes_df''')
```

[46]:
```
0
```

[47]:
```
cursor.connection.commit()
```

[48]:
```
for i,row in athletes_df.iterrows():
    #here %S means string values
    sql = "INSERT INTO jogos.athletes_df VALUES␣
 ↪(%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s)"
    cursor.execute(sql, tuple(row))
```

[49]:
```
cursor.connection.commit()
```

[50]:
```
cursor.execute('''SELECT * FROM athletes_df''')
```

[50]:
```
11656
```

Medals_df

[51]:
```
print(medals_df.info())
print(medals_df.head(5))
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2401 entries, 0 to 2400
Data columns (total 12 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   medal_type          2401 non-null   object
 1   medal_code          2401 non-null   int64
 2   medal_date          2401 non-null   object
 3   athlete_short_name  2401 non-null   object
 4   athlete_name        2401 non-null   object
 5   athlete_sex         2401 non-null   object
 6   athlete_link        2401 non-null   object
 7   country_code        2401 non-null   object
 8   discipline_code     2401 non-null   object
 9   event               2401 non-null   object
 10  country             2401 non-null   object
 11  discipline          2401 non-null   object
dtypes: int64(1), object(11)
memory usage: 225.2+ KB
None
     medal_type  medal_code            medal_date athlete_short_name  \
0    Gold Medal           1  2021-07-24 00:00:00.0             KIM JD
1    Gold Medal           1  2021-07-24 00:00:00.0               AN S
2  Silver Medal           2  2021-07-24 00:00:00.0       SCHLOESSER G
3  Silver Medal           2  2021-07-24 00:00:00.0           WIJLER S
4  Bronze Medal           3  2021-07-24 00:00:00.0          ALVAREZ L

          athlete_name athlete_sex  \
0          KIM Je Deok           X
1               AN San           X
2  SCHLOESSER Gabriela           X
3         WIJLER Steve           X
4         ALVAREZ Luis           X

                                       athlete_link country_code  \
0  ../../../en/results/archery/athlete-profile-n1…          KOR
1  ../../../en/results/archery/athlete-profile-n1…          KOR
2  ../../../en/results/archery/athlete-profile-n1…          NED
3  ../../../en/results/archery/athlete-profile-n1…          NED
4  ../../../en/results/archery/athlete-profile-n1…          MEX

  discipline_code       event            country discipline
0             ARC  Mixed Team  Republic of Korea    Archery
1             ARC  Mixed Team  Republic of Korea    Archery
2             ARC  Mixed Team        Netherlands    Archery
3             ARC  Mixed Team        Netherlands    Archery
4             ARC  Mixed Team             Mexico    Archery
```

[52]:
```
sql = '''CREATE TABLE medals_df (
  medal_type VARCHAR(100)
 ,medal_code INT
 ,medal_date DATE
 ,athlete_short_name VARCHAR(100)
 ,athlete_name VARCHAR(100)
 ,athlete_sex VARCHAR(100)
 ,athlete_link VARCHAR(100)
 ,country_code VARCHAR(10)
 ,discipline_code VARCHAR(10)
 ,event_name VARCHAR(100)
 ,country VARCHAR(100)
 ,discipline VARCHAR(100))'''
```

[53]:
```
sql
cursor.execute(sql)
```

[53]:
```
0
```

[54]:
```
cursor.connection.commit()
```

[55]:
```
for i,row in medals_df.iterrows():
    #here %S means string values
    sql = "INSERT INTO jogos.medals_df VALUES␣
 ↪(%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s)"
    cursor.execute(sql, tuple(row))
```

[56]:
```
cursor.connection.commit()
```

[57]:
```
cursor.execute('''SELECT * FROM medals_df''')
```

[57]:
```
2401
```

Consultas

1. Qual país tem o atleta mais velho? E o mais novo?

[432]:
```
sql = '''SELECT 1.0*datediff('2021-08-05', birth_date)/365 idade_em_anos, name,␣
 ↪country, birth_date
        FROM athletes_df
        order by 1 desc
        limit 1'''
df1 = pd.read_sql(sql, db)
print(df1)
print(f'\n')
```

```
   idade_em_anos        name    country  birth_date
0       66.72329  HANNA Mary  Australia  1954-12-01
```

[433]:
```
sql = '''SELECT 1.0*datediff('2021-08-05', birth_date)/365 idade_em_anos, name,␣
 ↪country, birth_date
        FROM athletes_df
        where birth_date is not null
        order by 1 asc
        limit 1'''
df2 = pd.read_sql(sql, db)
print(df2)
print(f'\n')
```

```
   idade_em_anos       name                country  birth_date
0           12.6  ZAZA Hend  Syrian Arab Republic  2009-01-01
```

[441]:
```
print(f"O atleta mais velho é da {df1['country'][0]} e o mais novo é da␣
 ↪{df2['country'][0]}")
```

```
O atleta mais velho é da Australia e o mais novo é da Syrian Arab Republic
```

2. Quais foram os 10 atletas que mais ganharam medalhas? Quantos ganharam mais de uma?

[447]:
```
sql = '''SELECT athlete_name, athlete_short_name, country, country_code,␣
 ↪count(*) qtde
        FROM medals_df
        group by athlete_name, athlete_short_name, country, country_code
        order by count(*) desc
        limit 10'''
df3 = pd.read_sql(sql, db)
df3
```

[447]:

	athlete_name	athlete_short_name	country	country_code	qtde
0	McKEON Emma	McKEON E	Australia	AUS	7
1	DRESSEL Caeleb	DRESSEL C	United States of America		
2	LEDECKY Kathleen	LEDECKY K	United States of America		
3	TITMUS Ariarne	TITMUS A	Australia		
4	SCOTT Duncan	SCOTT D	Great Britain		
5	McKEOWN Kaylee	McKEOWN K	Australia		
6	ZHANG Yufei	ZHANG Y	People's Republic of China		
7	XIAO Ruoteng	XIAO R	People's Republic of China		
8	HASHIMOTO Daiki	HASHIMOTO D	Japan		
9	NAGORNYY Nikita	NAGORNYY N	ROC		

```
1           USA     5
2           USA     4
3           AUS     4
4           GBR     4
5           AUS     4
6           CHN     4
7           CHN     3
8           JPN     3
9           ROC     3
```

[449]:
```
print(f"A atleta que mais ganhou medalhas foi {df3['athlete_name'][0]} da␣
↪{df3['country'][0]}, conquistando {df3['qtde'][0]} prêmios.")
```

```
A atleta que mais ganhou medalhas foi McKEON Emma da Australia, conquistando 7
prêmios.
```

[457]:
```
sql = '''SELECT count(*) qtde
        FROM(SELECT athlete_name, athlete_short_name, country, country_code,␣
↪count(*) qtde
        FROM medals_df
        group by athlete_name, athlete_short_name, country, country_code
        having count(*) > 1
        order by count(*) desc) a
        '''
df4 = pd.read_sql(sql, db)
print(df4)
print(f"\n\n {df4['qtde'][0]} atletas ganharam mais de uma medalha")
```

```
   qtde
0   182


 182 atletas ganharam mais de uma medalha
```

3. Qual a distribuição das alturas dos jogadores de basquete dos países que ganharam medalhas??

[460]:
```
#Vamos primeiro verificar se temos alturas nulas para esses atletas

sql = '''SELECT mdf.country, mdf.country_code, medal_code, gender, height_m
        FROM medals_df mdf
        inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
        where mdf.discipline = 'Basketball'
          and height_m is null
        order by gender, medal_code'''
df = pd.read_sql(sql, db, index_col='country_code')

#Não temos alturas nulas
```

[461]:
```
#altura dos jogadores de basquete dos países que ganharam medalhas

sql = '''SELECT mdf.country, mdf.country_code, medal_code, gender, count(*) as␣
↪qtde_atletas, avg(height_m) as altura_media, max(height_m) altura_max,␣
↪min(height_m) altura_min
       FROM medals_df mdf
       inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
       where mdf.discipline = 'Basketball'
       group by mdf.country, mdf.country_code, medal_code, gender
       order by gender, medal_code'''
df = pd.read_sql(sql, db, index_col='country_code')
df
```

[461]:

country_code	country	medal_code	gender	qtde_atletas	altura_media	altura_max	altura_min
USA	United States of America	1	Female	12	1.838333	2.03	1.55
JPN	Japan	2	Female	12	1.755833	1.85	1.62
FRA	France	3	Female	12	1.846667	1.97	1.68
USA	United States of America	1	Male	12	1.996667	2.13	1.91
FRA	France	2	Male	12	2.016667	2.18	1.78
AUS	Australia	3	Male	12	1.985000	2.11	1.83

[462]:
```
#Quartis das alturas dos jogadores de basquete que ganharam medalhas

sql = '''SELECT concat(mdf.medal_code, ' . ', mdf.country, ' - ', gender) team,␣
↪height_m, ntile(4) over (partition by concat(mdf.medal_code, ' . ',mdf.
↪country, ' - ', gender) order by height_m) part_aux
       FROM medals_df mdf
       inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
       where mdf.discipline = 'Basketball'
       order by concat(mdf.medal_code, ' . ',mdf.country, ' - ', gender),␣
↪height_m'''
df = pd.read_sql(sql, db)

sql2 = '''SELECT team, part_aux-1 quartil, min(height_m) valor
```

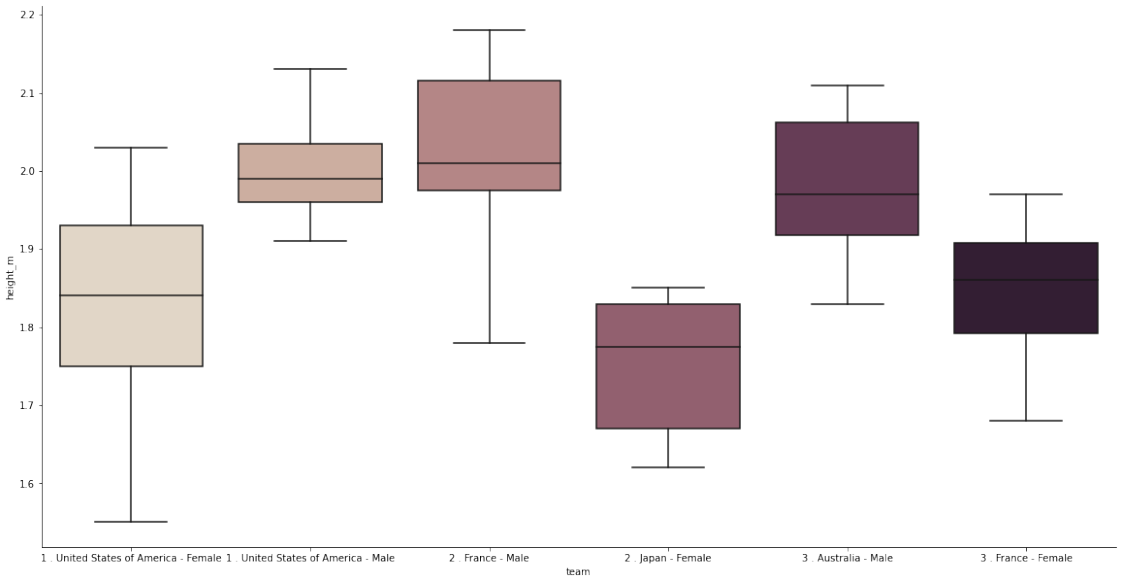
```
        from(SELECT concat(mdf.medal_code, ' . ', mdf.country, ' - ', gender)␣
↪team, height_m, ntile(4) over (partition by concat(mdf.medal_code, ' . ',mdf.
↪country, ' - ', gender) order by height_m) part_aux
        FROM medals_df mdf
        inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
        where mdf.discipline = 'Basketball') a
        where part_aux <> 1
        group by team, part_aux
        '''

df2 = pd.read_sql(sql2, db)
df2
```

[462]:

	team	quartil	valor
0	1 . United States of America - Female	1	1.75
1	1 . United States of America - Female	2	1.86
2	1 . United States of America - Female	3	1.93
3	1 . United States of America - Male	1	1.96
4	1 . United States of America - Male	2	2.00
5	1 . United States of America - Male	3	2.05
6	2 . France - Male	1	1.98
7	2 . France - Male	2	2.03
8	2 . France - Male	3	2.13
9	2 . Japan - Female	1	1.67
10	2 . Japan - Female	2	1.81
11	2 . Japan - Female	3	1.83
12	3 . Australia - Male	1	1.92
13	3 . Australia - Male	2	1.98
14	3 . Australia - Male	3	2.07
15	3 . France - Female	1	1.80
16	3 . France - Female	2	1.88
17	3 . France - Female	3	1.93

[463]:
```
a = sns.catplot(x='team', y='height_m',kind="box", palette="ch:.25", data = df,␣
↪height=8.27, aspect=16/8.27)
```



4. Qual a idade média dos atletas dos 10 paíeses que mais ganharam medalhas? E qual a idade média apenas dos atletas que ganharam medalhas desses mesmos países?

[63]:
```
sql = '''SELECT mtdf.country_code, avg(1.0*datediff('2021-08-05', birth_date)/
 ↪365) idade_media, count(distinct name) qtde_atletas
        FROM medals_total_df mtdf
        inner join athletes_df adf on mtdf.country_code = adf.country_code
        group by mtdf.country_code
        order by rank_country
        limit 10'''
df = pd.read_sql(sql, db, index_col='country_code')
df
```

[63]:

country_code	idade_media	qtde_atletas
USA	27.777585	633
CHN	26.095097	418
JPN	26.982766	613
GBR	27.482969	392
ROC	27.192120	341
AUS	27.451834	489
NED	28.339972	283
FRA	27.857005	396
GER	27.827735	415
ITA	27.370153	379

[64]:
```
sql = '''SELECT mtdf.country_code, avg(1.0*datediff('2021-08-05', birth_date)/
 ↪365) idade_media, count(distinct athlete_name) qtde_atletas
```

```
        FROM medals_total_df mtdf
        inner join medals_df mdf on mtdf.country_code = mdf.country_code
        inner join athletes_df adf on mtdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
        group by mtdf.country_code
        order by rank_country
        limit 10'''
df = pd.read_sql(sql, db, index_col='country_code')
df
```

[64]:

country_code	idade_media	qtde_atletas
USA	27.017934	257
CHN	26.165049	114
JPN	26.402908	114
GBR	27.396207	112
ROC	26.914807	128
AUS	26.889872	99
NED	28.425020	62
FRA	28.815485	130
GER	29.201027	71
ITA	27.366539	65

5. Qual o atleta mais velho e o mais novo a ganhar uma medalha?

[464]:
```
sql = '''SELECT adf.name, adf.short_name, mdf.country_code, mdf.discipline, 1.
↪0*datediff(medal_date, birth_date)/365 idade
        FROM medals_df mdf
        inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
        where medal_date is not null
          and birth_date is not null
        order by 1.0*datediff(medal_date, birth_date)/365 desc
        limit 1'''
df5 = pd.read_sql(sql, db, index_col='country_code')
df5
```

[464]:

country_code	name	short_name	discipline	idade
AUS	HOY Andrew	HOY A	Equestrian	62.52329

[465]:
```
sql = '''SELECT adf.name, adf.short_name, mdf.country_code, mdf.discipline, 1.
↪0*datediff(medal_date, birth_date)/365 idade
        FROM medals_df mdf
        inner join athletes_df adf on mdf.country_code = adf.country_code and␣
↪mdf.athlete_name = adf.name
        where medal_date is not null
```

```
          and birth_date is not null
        order by 1.0*datediff(medal_date, birth_date)/365 asc
        limit 1'''
df6 = pd.read_sql(sql, db, index_col='country_code')
df6
```

[465]:

country_code	name	short_name	discipline	idade
JPN	HIRAKI Kokona	HIRAKI K	Skateboarding	12.94795

[467]:
```
print(f"O atleta mais velho a ganhar medalhas foi o {df5['name'][0]} com␣
↪{df5['idade'][0]} anos, enquanto o mais novo foi o {df6['name'][0]} com␣
↪{df6['idade'][0]} anos")
```

```
O atleta mais velho a ganhar medalhas foi o HOY Andrew com 62.52329 anos,
enquanto o mais novo foi o HIRAKI Kokona com 12.94795 anos
```

6. Quais modalidades possuem mais categorias distintas? E quis são disputada por atletas de mais paises diferentes?

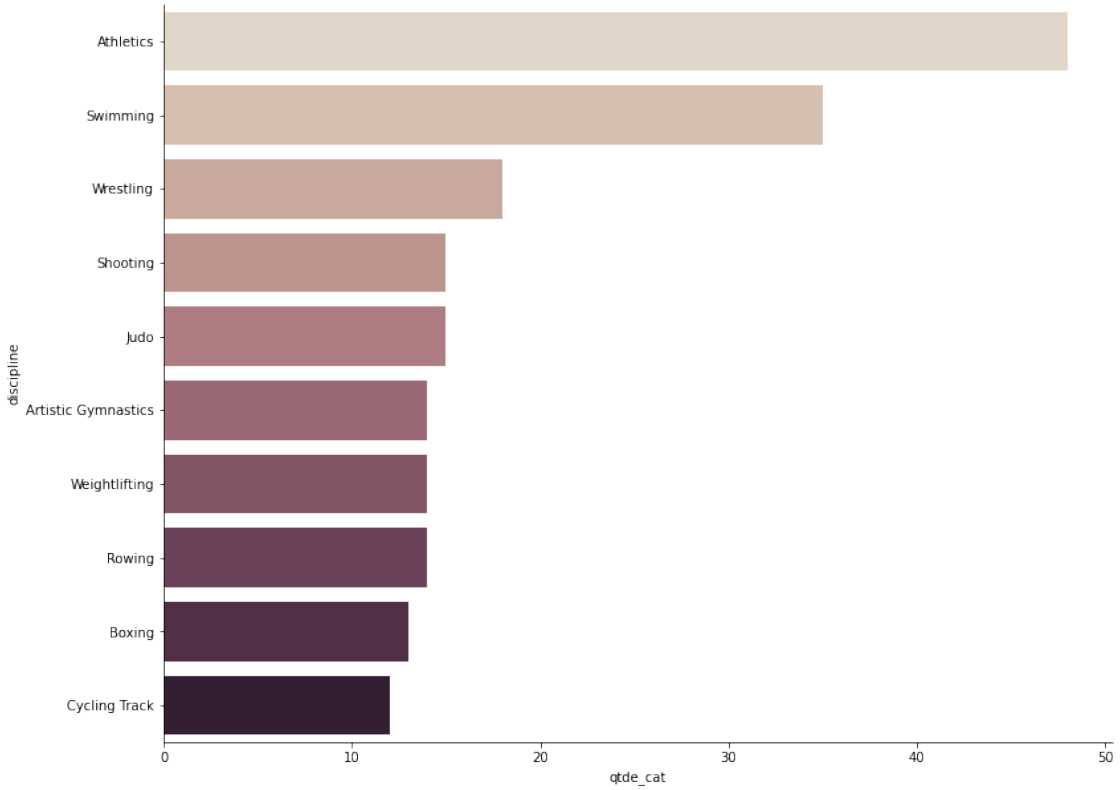
[468]:
```
sql = '''SELECT discipline
        ,count(distinct event_name) qtde_cat
        FROM medals_df mdf
        group by discipline
        order by count(distinct event_name) desc
        limit 10'''
df = pd.read_sql(sql, db, index_col='discipline')
df = df.reset_index()
df
```

[468]:

	discipline	qtde_cat
0	Athletics	48
1	Swimming	35
2	Wrestling	18
3	Shooting	15
4	Judo	15
5	Artistic Gymnastics	14
6	Weightlifting	14
7	Rowing	14
8	Boxing	13
9	Cycling Track	12

[196]:
```
sns.catplot(y='discipline', x='qtde_cat', kind="bar", palette="ch:.25", data =␣
↪df, height=8.27, aspect=11.7/8.27)
```

[196]: <seaborn.axisgrid.FacetGrid at 0x7fd7865d4fa0>



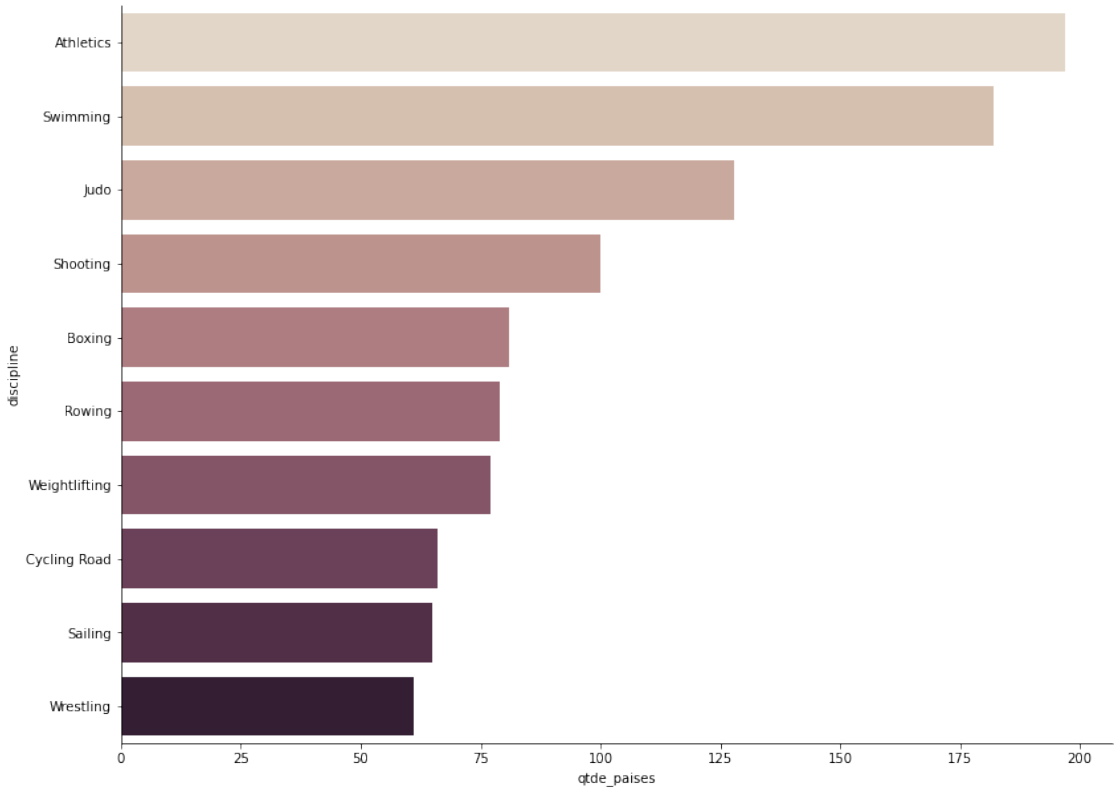
[197]:
```
sql = '''SELECT adf.discipline
        ,count(distinct adf.country_code) qtde_paises
        FROM athletes_df adf
        group by adf.discipline
        order by count(distinct adf.country_code) desc
        limit 10'''
df = pd.read_sql(sql, db, index_col='discipline')
df = df.reset_index()
df
```

[197]:

	discipline	qtde_paises
0	Athletics	197
1	Swimming	182
2	Judo	128
3	Shooting	100
4	Boxing	81
5	Rowing	79
6	Weightlifting	77
7	Cycling Road	66
8	Sailing	65
9	Wrestling	61

[198]:
```
sns.catplot(y='discipline', x='qtde_paises', kind="bar", palette="ch:.25", data
↪= df, height=8.27, aspect=11.7/8.27)
```

[198]:
```
<seaborn.axisgrid.FacetGrid at 0x7fd7865bac70>
```



7. Qual a porcentagem de equipes femininas que são comandadas por homens? E de equipes masculinas comandadas por mulheres?

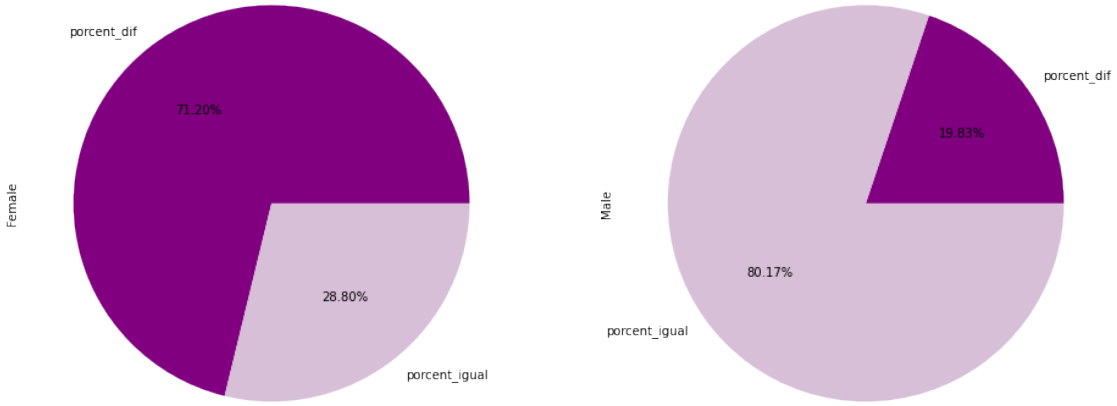
[488]:
```
sql = '''select genero_equipe, 1.0*sum(genero_diff)/count(*) porcent_dif, 1- 1.
↪0*sum(genero_diff)/count(*) porcent_igual
       from(select codf.country_code, codf.discipline, codf.event_name, adf.
↪gender genero_equipe, case when adf.gender = codf.gender then 0 else 1 end
↪genero_diff
               from coaches_df codf
               inner join medals_df mdf on mdf.country_code = codf.
↪country_code and codf.discipline = mdf.discipline
               inner join athletes_df adf on mdf.country_code = adf.
↪country_code and mdf.athlete_name = adf.name
               where adf.gender is not null
                 and codf.gender is not null ) as a
       group by genero_equipe
       order by genero_equipe'''
```

```
df = pd.read_sql(sql, db, index_col='genero_equipe')
df2 = df.T
df2
```

[488]:

genero_equipe	Female	Male
porcent_dif	0.71196	0.19833
porcent_igual	0.28804	0.80167

[489]:
```
ax = df2.plot.pie(subplots=True, figsize=(16, 8), legend=None, autopct='%.
↪2f%%',  colors = ['purple', 'thistle'] )
```



Enquanto 71% das equipes femininas são comandadas por homens, apenas 19% das equipes masculinas são comandadas por mulheres.

8. Qual o tamanho da delegação brasileira considerando atletas, técnicos e equipes técnicas?

[507]:
```
sql = '''select count(*) qtde
        from(
            select distinct name, short_name, discipline
            from(
                select name, short_name, discipline
                from coaches_df cdf
                where country_code = 'BRA'
                union all
                select name, short_name, discipline
                from athletes_df cdf
                where country_code = 'BRA'
                union all
                select name, short_name, discipline
                from technical_officials_df
                where country = 'BRAZIL'
```

```
            ) a
        ) b
        '''
df7 = pd.read_sql(sql, db)
print(df7)

print(f"\n\n A delegação brasileira possui {df7['qtde'][0]} integrantes ")
```

```
   qtde
0   341
```

```
 A delegação brasileira possui 341 integrantes
```

9. Qual país que possui a maior equipe técnica no voleibol? Quais países ganharam medalha nesse esporte?

[307]:
```
sql = '''select todf.country, todf.discipline
         ,count(distinct(concat(todf.name, todf.short_name, todf.discipline,␣
 ↪todf.country))) tam_equipe
         from technical_officials_df todf
         where todf.discipline = 'Volleyball'
         group by country, discipline
         order by 3 desc
         limit 20
        '''
df = pd.read_sql(sql, db, index_col='country')
df
```

[307]:

country	discipline	tam_equipe
Japan	Volleyball	74
Serbia	Volleyball	3
Italy	Volleyball	3
Brazil	Volleyball	2
Argentina	Volleyball	2
Slovakia	Volleyball	2
France	Volleyball	2
Russian Fe	Volleyball	2
United Sta	Volleyball	1
Spain	Volleyball	1
Republic o	Volleyball	1
Poland	Volleyball	1
Philippine	Volleyball	1
People's R	Volleyball	1
Netherland	Volleyball	1
Mexico	Volleyball	1
Latvia	Volleyball	1

```
Germany     Volleyball           1
Dominican   Volleyball           1
Cuba        Volleyball           1
```

[384]:
```
sql = '''select distinct concat(medal_code, '.', mdf.country) country,␣
 ↪athlete_sex, mdf.discipline
        from medals_df mdf
        inner join athletes_df adf on mdf.country_code = adf.country_code and␣
 ↪mdf.athlete_name = adf.name
        where mdf.discipline = 'Volleyball'
        order by concat(medal_code, '.', mdf.country), athlete_sex, discipline␣
 ↪desc
        limit 20
       '''
df = pd.read_sql(sql, db)
df
```

[384]:

	country	athlete_sex	discipline
0	1.France	M	Volleyball
1	1.United States of America	W	Volleyball
2	2.Brazil	W	Volleyball
3	2.ROC	M	Volleyball
4	3.Argentina	M	Volleyball
5	3.Serbia	W	Volleyball

10. Quantos atletas ganharam medalhas disputando os jogos por países diferentes do de nascimento?

[408]:
```
sql = '''select medal_code
        ,gender
        ,count(*) qtde_por_medalha
        ,sum(count(*)) over(partition by gender) qtde_total
         from medals_df mdf
         inner join athletes_df adf on mdf.country_code = adf.country_code and␣
 ↪mdf.athlete_name = adf.name
         where birth_country <> adf.country
           and birth_country is not null
           and adf.country is not null
        group by medal_code, gender
        order by gender, medal_code
        '''
df = pd.read_sql(sql, db)
df
```

[408]:

	medal_code	gender	qtde_por_medalha	qtde_total
0	1	Female	39	115.0
1	2	Female	46	115.0
2	3	Female	30	115.0

```
3           1    Male              24       120.0
4           2    Male              59       120.0
5           3    Male              37       120.0
```