

DUT STID, Université de la Côte d'Azur

Bases de données avancées

Accès à BD avec python

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Se connecter à une base de données MySQL

In [45]:

```
import mysql.connector as mysql

db = mysql.connect(user='superheroadmin',
                   password='Passw0rd.',
                   port=3306,
                   database='superheroes')
```

In [47]:

```
%env MYSQL_USER=superheroadmin
%env MYSQL_PASSWORD=Passw0rd.
%env MYSQL_HOST_IP=localhost
%env MYSQL_PORT=3306
```

```
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env: MYSQL_PASSWORD=Passw0rd.
env: MYSQL_HOST_IP=localhost
env: MYSQL_PORT=3306
```

In [49]:

```
import os

db_name = 'superheroes'

db = mysql.connect(user=os.environ['MYSQL_USER'],
                  password=os.environ['MYSQL_PASSWORD'],
                  port=os.environ['MYSQL_PORT'],
                  database=db_name)
```

In [50]:

```
cursor = db.cursor()
```

In [56]:

```
query = 'SELECT * FROM heroes;'  
cursor.execute(query)
```

In [57]:

```
for r in cursor:  
    print(r)
```

In [55]:

```
cursor.execute('DELETE FROM heroes;')  
db.commit()
```

In [58]:

```
add_hero_query = ('INSERT INTO heroes '  
                  '(id, name, identity, birth_place, publisher, height, weight, gen'  
                  ' first_appearance, eye_color, hair_color, strength, intelligence'  
                  'VALUES (%s, %s, %s, %s, %s, %s, %s, %s, %s, %s, %s, %s, %s);')
```

In [59]:

```
wonder_woman = (1, 'Wonder Woman', 'Diana Prince', 'Themyscira',  
                'DC Comics', 183.13, 74.74, 'F', 1941, 'Blue',  
                'Black', 100, 'high')  
cursor.execute(add_hero_query, wonder_woman)
```

In [60]:

```
db.commit()
```

In [61]:

```
heroes = [  
    (3, 'Wolverine', 'Logan', 'Alberta, Canada',  
     'Marvel Comics', 160.70, 135.21, 'M', None,  
     'Blue', 'Black', 35, 'good'),  
    (4, 'Spider-Man', 'Peter Parker', 'New York, New York',  
     'Marvel Comics', 178.28, 74.25, 'M', None,  
     'Hazel', 'Brown', 55, 'high'),  
    (5, 'Professor X', 'Charles Francis Xavier', 'New York, New York',  
     'Marvel Comics', 183.74, 86.89, 'M', 1963,  
     'Blue', 'No Hair', 10, 'high')  
]  
  
cursor.executemany(add_hero_query, heroes)
```

In [62]:

```
db.commit()
```

In [63]:

```
query = 'SELECT name, identity, first_appearance FROM heroes;'
cursor.execute(query)
for name, identity, first_appearance in cursor:
    print('{} aka {} ({}).format(name, identity, first_appearance))
```

```
Wonder Woman aka Diana Prince (1941)
Wolverine aka Logan (None)
Spider-Man aka Peter Parker (None)
Professor X aka Charles Francis Xavier (1963)
```

In [64]:

```
parametrized_query = 'SELECT name, identity FROM heroes WHERE eye_color = %s;'
cursor.execute(parametrized_query, ('Blue',))
for name, identity in cursor:
    print('{} aka {}'.format(name, identity))
```

```
Wonder Woman aka Diana Prince
Wolverine aka Logan
Professor X aka Charles Francis Xavier
```

In [47]:

```
cursor.close()
db.close()
```

In [29]:

```
import csv

with open('heroes.csv', 'r') as heroes_file:
    heroes_reader = csv.reader(heroes_file, delimiter=';', quotechar='"')
    heroes = list(heroes_reader)[1:]
```

In [42]:

```
def exists_in_db(hero, cursor):
    cursor.execute('SELECT name FROM heroes WHERE name=%s', (hero,))
    cursor.fetchall()
    return cursor.rowcount > 0
```

In [43]:

```
exists_in_db('Wonder Woman', cursor)
```

Out[43]:

True

In [44]:

```
exists_in_db('Wonder Wman', cursor)
```

Out[44]:

False

In [45]:

```
def next_id(cursor):  
    cursor.execute('SELECT max(id) FROM heroes;')  
    return cursor.fetchall()[0][0] + 1
```

In [96]:

```
def to_float(s):  
    return float(s) if s else None  
  
def to_int(s):  
    return int(s) if s else None  
  
def to_str(s, max_size=1000):  
    return s.encode('ascii', 'ignore')[:max_size] if s else None  
  
converters = 4 * [to_str] + 2 * [to_float] + [to_str, to_int] + 2 * [lambda s: to_s  
def to_record(h):  
    return [c(s) for c, s in zip(converters, h)]
```

In [72]:

```
cursor.execute('DELETE FROM heroes WHERE name="A-Bomb";')  
db.commit()
```

In [97]:

```
for h in heroes:
    print('checking {}'.format(h[0]), end=' ')
    if exists_in_db(h[0], cursor):
        print('already existing: skipping.')
    else:
        new_id = next_id(cursor)
        print('adding with new id {}'.format(new_id))
        cursor.execute(add_hero_query, [new_id]+to_record(h))

db.commit()
```

```
checking A-Bomb... already existing: skipping.
checking Abraxas... already existing: skipping.
checking Abomination... already existing: skipping.
checking Adam Monroe... already existing: skipping.
checking Agent 13... already existing: skipping.
checking Air-Walker... already existing: skipping.
checking Agent Bob... already existing: skipping.
checking Abe Sapien... already existing: skipping.
checking Abin Sur... already existing: skipping.
checking Angela... already existing: skipping.
checking Animal Man... already existing: skipping.
checking Agent Zero... already existing: skipping.
checking Colin Wagner... already existing: skipping.
checking Angel Dust... already existing: skipping.
checking Angel Salvadore... already existing: skipping.
checking Zoom... already existing: skipping.
checking Lady Deathstrike... already existing: skipping.
checking Yoda... already existing: skipping.
checking Zatanna... already existing: skipping.
checking Yellowjacket II... already existing: skipping.
```

In [7]:

```
import pandas as pd
from sqlalchemy import create_engine

engine = create_engine('mysql+mysqlconnector://superheroadmin:Passw0rd.@localhost:3306?charset=utf8mb4&collation=utf8mb4_unicode_ci&echo=False')
```

In [8]:

```
df = pd.read_sql('SELECT * FROM heroes;', engine, index_col='id')
```

In [9]:

```
df
```

Out[9]:

	name	identity	birth_place	publisher	height	weight	gender	first_appearance	eye_co
id									
1	Wonder Woman	Diana Prince	Themyscira	DC Comics	183.13	74.74	F	1941.0	B
3	Wolverine	Logan	Alberta, Canada	Marvel Comics	160.70	135.21	M	NaN	B
4	Spider-Man	Peter Parker	New York, New York	Marvel Comics	178.28	74.25	M	NaN	Ha
5	Professor X	Charles Francis Xavier	New York, New York	Marvel Comics	183.74	86.89	M	1963.0	B

In [120]:

```
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```

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env: MYSQL_PORT=3306
```

In [121]:

```
import os

db_name = 'superheroes'

connection_uri = ('mysql+mysqlconnector://' +
                  os.environ['MYSQL_USER'] + ':' +
                  os.environ['MYSQL_PASSWORD'] + '@' +
                  os.environ['MYSQL_HOST_IP'] + ':' +
                  os.environ['MYSQL_PORT'] + '/' + db_name)
```

In [123]:

```
engine = create_engine(connection_uri, echo=False)
```

In [129]:

```
pd.read_sql('SELECT * FROM heroes where eye_color="Red";', engine, index_col='id')
```

Out[129]:

id	name	identity	birth_place	publisher	height	weight	gender	first_appearanc
21	Zoom	Hunter Zolomon	None	DC Comics	185.90	81.93	M	NaI
43	Wonder Man	Simon Williams	Paterson, New Jersey	Marvel Comics	188.90	171.57	M	NaI
45	Warlock	Adam Warlock	The Beehive, Shard Island, Atlantic Ocean	Marvel Comics	188.22	108.14	M	NaI
53	Vision II	Vision	Place of birth unknown	Marvel Comics	191.39	135.51	None	NaI
71	Ultron	Ultron	Created in Cresskill, New Jersey	Marvel Comics	206.90	331.61	M	1968.
92	Thanos	Thanos	Titan	Marvel Comics	201.26	443.19	M	NaI
99	T-800	Cyberdyne Systems Series 800 Terminator Model 101	None	Dark Horse Comics	NaN	176.28	M	1984.
100	T-850	Cyberdyne Systems Series 850 Terminator	None	Dark Horse Comics	NaN	198.72	M	2003.
104	Swamp Thing	Alec Holland	None	DC Comics	NaN	NaN	M	1972.
115	Steppenwolf	None	None	DC Comics	183.36	91.04	M	NaI
126	Spider-Woman IV	Charlotte Witter	None	Marvel Comics	178.09	58.78	F	NaI
160	Shadow King	Amahl Farouk	None	Marvel Comics	185.48	149.19	None	1979.
173	Sasquatch	Walter Langkowski	Edmonton, Alberta, Canada	Marvel Comics	305.02	900.70	M	NaI
246	Onslaught	Onslaught	None	Marvel Comics	305.41	405.08	M	1996.
249	Omega Red	Arkady Gregorivich	None	Marvel Comics	211.79	191.40	M	NaI
288	Mister Sinister	Nathaniel Essex	London, England	Marvel Comics	196.89	128.37	M	1987.
295	Miss Martian	M'gann M'orzz	Mars	DC Comics	178.49	61.25	F	2006.
316	Martian Manhunter	J'onnn J'onzz	None	DC Comics	201.86	135.18	M	1955.

id	name	identity	birth_place	publisher	height	weight	gender	first_appearanc
322	Machine Man	X-51, Aaron Stack	Central City, California	Marvel Comics	183.42	383.81	None	NaI
323	Man-Thing	Dr. Theodore Sallis	None	Marvel Comics	213.38	225.60	M	1971.
335	Lobo	Lobo	None	DC Comics	229.40	288.82	M	NaI
352	Klaw	Ulysses Klaw	Vlaardingen, Netherlands	Marvel Comics	188.61	97.99	M	1966.
355	Lizard	Curtis Connors	Coral Gables, Florida	Marvel Comics	203.53	230.60	M	NaI
359	Kilowog	None	Bolovax Vik	DC Comics	234.39	324.10	M	1986.
360	Killer Croc	Waylon Jones	None	DC Comics	244.58	356.55	M	1983.
374	Jubilee	Jubilation Lee	Beverly Hills, California	Marvel Comics	165.92	52.34	F	1989.
430	Hellstorm	Daimon Hellstrom	Greentown, Massachusetts	Marvel Comics	185.02	81.45	M	NaI
438	Hawk	Henry Hall	None	DC Comics	185.91	89.40	M	1968.
469	Gambit	Remy Etienne LeBeau	New Orleans, Louisiana	Marvel Comics	185.55	81.57	M	2006.
470	Ghost Rider	Johnny Blaze	Waukegan, Illinois	Marvel Comics	188.51	99.20	M	1972.
484	Fixer	Paul Norbert Ebersol	Dayton, Ohio	Marvel Comics	NaN	NaN	None	NaI
488	Fin Fang Foom	None	None	Marvel Comics	975.37	19.00	M	NaI
499	Evilhawk	Dargin Bokk	None	Marvel Comics	191.25	106.78	M	1992.
502	Etrigan	Jason Blood	Hell	DC Comics	193.76	203.50	M	1972.
511	Drax the Destroyer	Arthur Sampson Douglas	Burbank, California	Marvel Comics	193.01	306.42	M	1973.
513	Doomsday	Doomsday	Krypton	DC Comics	244.01	412.67	M	1992.
526	Demogoblin	None	None	Marvel Comics	185.05	95.29	M	1992.
540	Darkseid	Uxas	None	DC Comics	267.37	817.57	M	1970.
556	Copycat	Vanessa Carlysle	None	Marvel Comics	183.47	67.55	F	1991.
581	Captain Planet	None	None	Marvel Comics	NaN	NaN	M	NaI
628	Blackwulf	Lucian	Armechadon	Marvel Comics	188.17	88.64	M	1994.

id	name	identity	birth_place	publisher	height	weight	gender	first_appearanc
631	Blackout	None	None	Marvel Comics	191.20	104.09	M	1990.
644	Black Abbott	None	None	Marvel Comics	NaN	NaN	M	1984.
700	Apocalypse	En Sabah Nur	Akkaba, Egypt	Marvel Comics	213.77	135.62	M	1986.
715	Amazo	None	None	DC Comics	257.49	173.95	M	1960.

In [125]:

```
cursor.execute('''CREATE TABLE episodes (
    id INT AUTO_INCREMENT,
    name VARCHAR(255) NOT NULL,
    PRIMARY KEY (id)
);''')
```

In [126]:

```
cursor.execute('''CREATE TABLE episodes_heroes (
    id_episode INT,
    id_hero INT
);''')
```

In [139]:

```
episodes = pd.DataFrame([(1, 'Episode 1',),
                        (2, 'Episode 2',),
                        (3, 'Episode 3',),
                        (4, 'Episode 4',)], columns=['id', 'name'])
```

episodes

Out[139]:

	id	name
0	1	Episode 1
1	2	Episode 2
2	3	Episode 3
3	4	Episode 4

In []:

