

Accès à BD via ORM

Prof. Dario Malchiodi



ORM pour une BD existante

In [2]:

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

In [37]:

```
from sqlalchemy import Column, Integer, Float, String

from sqlalchemy.ext.declarative import declarative_base
Base = declarative_base()

class Hero(Base):
    __tablename__ = 'heroes'

    id = Column(Integer, primary_key=True)
    name = Column(String(100))
    identity = Column(String(100))
    birth_place = Column(String(100))
    publisher = Column(String(100))
    height = Column(Float)
    weight = Column(Float)
    gender = Column(String(1))
    first_appearance = Column(Integer)
    eye_color = Column(String(10))
    hair_color = Column(String(10))
    strength = Column(Float)
    intelligence = Column(String(20))

    def __repr__(self):
        return "<{} aka {}>".format(self.name, self.identity)
```

In [38]:

```
from sqlalchemy.orm import sessionmaker
Session = sessionmaker(bind=engine)
session = Session()
```

In [39]:

```
query = session.query(Hero)
```

In [40]:

```
query[:10]
```

Out[40]:

```
[<Wonder Woman aka Diana Prince>,
 <Wolverine aka Logan>,
 <Spider-Man aka Peter Parker>,
 <Professor X aka Charles Francis Xavier>,
 <A-Bomb aka Richard Milhouse Jones>,
 <Abraxas aka Abraxas>,
 <Abomination aka Emil Blonsky>,
 <Adam Monroe aka None>,
 <Agent 13 aka Sharon Carter>,
 <Air-Walker aka Gabriel Lan>]
```

In [41]:

```
# query.all()
```

In [59]:

```
for h in session.query(Hero).filter(Hero.first_appearance==1960):
    print(h)
```

```
<Trickster aka Giovanni Giuseppe>
<Kid Flash aka Wallace Rudolph West>
<Groot aka Groot>
<Flash III aka Wally West>
<Elongated Man aka Ralph Dibny>
<Clock King aka William Tockman>
<Aqualad aka Garth>
<Amazo aka None>
```

In [80]:

```
for h in session.query(Hero).filter(Hero.first_appearance==1960):  
    print(h)
```

```
<Trickster aka Giovanni Giuseppe>  
<Kid Flash aka Wallace Rudolph West>  
<Groot aka Groot>  
<Flash III aka Wally West>  
<Elongated Man aka Ralph Dibny>  
<Clock King aka William Tockman>  
<Aqualad aka Garth>  
<Amazo aka None>
```

In [82]:

```
for h in (session.query(Hero).filter(Hero.first_appearance==1960)  
         .filter(Hero.eye_color=='Green')):  
    print(h)
```

```
<Kid Flash aka Wallace Rudolph West>
```

In [84]:

```
from sqlalchemy import and_, or_  
for h in session.query(Hero).filter(and_(Hero.first_appearance==1960,  
                                       Hero.eye_color=='Green')):  
    print(h)
```

```
<Kid Flash aka Wallace Rudolph West>
```

In [85]:

```
for h in session.query(Hero).filter(or_(Hero.first_appearance==1960,
                                       Hero.eye_color=='Green')):
    print(h)
```

```
<Abomination aka Emil Blonsky>
<X-23 aka Laura Kinney>
<Wolfsbane aka Rahne Sinclair>
<Vanisher aka None>
<Triton aka Triton>
<Tigra aka Greer Grant Nelson>
<Thundra aka Thundra>
<Trickster aka Giovanni Giuseppe>
<Starfire aka Koriand'r>
<Spider-Woman aka Jessica Drew>
<Speedy aka Thea Queen>
<Songbird aka Melissa Joan Gold>
<Skaar aka None>
<Scorpia aka Elaine Coll>
<Rogue aka Anna Marie>
<Robin VI aka Carrie Kelley>
<She-Hulk aka Jennifer Walters>
<Ripcord aka Miranda Leevald>
<Red Tornado aka John Smith>
<Red Arrow aka Roy Harper>
<Ray aka Ray Terrill>
<Ra's Al Ghul aka Ra's Al Ghul>
<Proto-Goblin aka Nels Van Adder>
<Polaris aka Lorna Dane>
<Poison Ivy aka Pamela Isley>
<Plantman aka Samuel Smithers>
<Phoenix aka Jean Grey>
<Metallo aka John Corben>
<Medusa aka Medusalith Amaquelin Boltagon>
<Marvel Girl aka Rachel Anne Summers>
<Mantis aka None>
<Lyja aka Lyja>
<Loki aka Loki Laufeyson>
<Lex Luthor aka Lex Luthor>
<Leader aka Samuel Sterns>
<Kyle Rayner aka Kyle Rayner>
<Kid Flash aka Wallace Rudolph West>
<Joker aka Jack Napier>
<John Stewart aka John Stewart>
<Jyn Erso aka Jyn Erso>
<Jessica Cruz aka Jessica Cruz>
<Jean Grey aka Jean Grey>
<Hope Summers aka Hope Summers>
<Hulk aka Bruce Banner>
<Hela aka None>
<Hawkwoman aka Shayera Hol>
<Harry Potter aka Harry James Potter>
<Hawkgirl aka Kendra Saunders>
<Green Goblin IV aka Phillip Benjamin Urich>
<Groot aka Groot>
<Goblin Queen aka Madelyne Jennifer Pryor>
<Giganta aka Doris Zuel>
<Green Arrow aka Oliver Queen>
<Flash III aka Wally West>
```

```
<Firestar aka Angelica Jones>
<Elongated Man aka Ralph Dibny>
<Donatello aka None>
<Clock King aka William Tockman>
<Citizen Steel aka Nathan Heywood>
<Crystal aka Crystallia Amaquelin>
<Cheetah aka Priscilla Rich>
<Cheetah II aka Deborah Domaine>
<Catwoman aka Selina Kyle>
<Carnage aka Cletus Kasady>
<Brainiac 5 aka Querl Dox>
<Brainiac aka Vril Dox>
<Buffy aka Buffy Anne Summers>
<Blink aka Clarice Ferguson>
<Black Mamba aka Tanya Sealy>
<Black Widow aka Natasha Romanoff>
<Black Cat aka Felicia Hardy>
<Beast Boy aka Garfield Mark Logan>
<Batwoman V aka Katherine Rebecca Kane>
<Batgirl aka Barbara Gordon>
<Banshee aka Sean Cassidy>
<Batgirl IV aka Cassandra Cain>
<Aqualad aka Garth>
<Annihilus aka Annihilus>
<Amazo aka None>
```

In [88]:

```
for h in (session.query(Hero)
          .filter(Hero.name.contains('Woman'))
          .order_by(Hero.first_appearance)):
    print(h)
```

```
<Spider-Woman IV aka Charlotte Witter>
<Spider-Woman II aka None>
<Invisible Woman aka Susan Storm Richards>
<Hawkwoman II aka Sharon Parker>
<Hawkwoman III aka Shayera Thal>
<Catwoman aka Selina Kyle>
<Bionic Woman aka Jamie Sommers>
<Wonder Woman aka Diana Prince>
<Hawkwoman aka Shayera Hol>
<Spider-Woman aka Jessica Drew>
<Spider-Woman III aka Martha Franklin>
<Batwoman V aka Katherine Rebecca Kane>
```

In [44]:

```
for h in session.query(Hero).filter(Hero.name.like('%xy%')):
    print(h)
```

```
<Mister Mxyzptlk aka Mr. Mxyzptlk>
```

In [23]:

```
from sqlalchemy.sql.expression import func

for h in session.query(Hero).filter(func.length(Hero.name)==17):
    print(h)
```

```
<Scarlet Spider II aka Kaine Parker'>
<Martian Manhunter aka J'onnn J'onzz'>
<Kraven the Hunter aka Sergei Kravinoff'>
<Franklin Richards aka Franklin Richards'>
<Captain Marvel II aka Frederick Christopher Freeman'>
<Captain Hindsight aka Jack Brolin'>
<Alfred Pennyworth aka Alfred Thaddeus Crane Pennyworth'>
```

In [77]:

```
def same_initials(name):
    try:
        if not name:
            return False
        name = ' '.join(name.split())
        words = name.split(' ')
        if len(words) == 1:
            return False
        initials = set([w[0] for w in words])
        return len(initials) == 1
    except IndexError:
        print('error with <{}>'.format(name))
        return False

[h for h in session.query(Hero).all() if same_initials(h.name)]
```

Out[77]:

```
[<Wonder Woman aka Diana Prince>,
<Wyatt Wingfoot aka Wyatt Wingfoot>,
<Silver Surfer aka Norrin Radd>,
<Silk Spectre aka Sally Juspeczyk>,
<Sebastian Shaw aka Sebastian Hiram Shaw>,
<Scarlet Spider aka Benjamin Reilly>,
<Rocket Raccoon aka Rocket Raccoon>,
<Red Robin aka Tim Drake>,
<Peter Petrelli aka Peter Petrelli>,
<Multiple Man aka James Arthur>,
<Moses Magnum aka Moses Magnum>,
<Molten Man aka Mark Raxton>,
<Mister Mxyzptlk aka Mr. Mxyzptlk>,
<Miss Martian aka M'gann M'orzz>,
<Minna Murray aka Wilhelmina Harker>,
<Martian Manhunter aka J'onnn J'onzz>,
<Machine Man aka X-51, Aaron Stack>,
<Lightning Lad aka Garth Ranzz>,
<Light Lass aka Ayla Ranzz>,
<Lex Luthor aka Lex Luthor>,
<Lightning Lord aka Mekt Ranzz>,
<King Kong aka King Kong>,
<Karate Kid aka Val Armorr>,
<Jessica Jones aka Jessica Campbell Jones Cage>,
<Guy Gardner aka Guy Gardner>,
<Gorilla Grodd aka Grodd>,
<Granny Goodness aka None>,
<Green Goblin aka Norman Osborn>,
<Fin Fang Foom aka None>,
<Doctor Doom aka Victor von Doom>,
<Crimson Crusader aka Rory Destine>,
<Captain Cold aka Leonard Snart>,
<Blue Beetle aka None>,
<Black Bolt aka Blackagar Boltagon>,
<Big Barda aka Barda Free>,
<Beast Boy aka Garfield Mark Logan>]
```

In [79]:

```
[h for h in session.query(Hero).all() if same_initials(h.name) and same_initials(h.
```

Out[79]:

```
[<Wyatt Wingfoot aka Wyatt Wingfoot>,  
<Rocket Raccoon aka Rocket Raccoon>,  
<Peter Petrelli aka Peter Petrelli>,  
<Moses Magnum aka Moses Magnum>,  
<Mister Mxyzptlk aka Mr. Mxyzptlk>,  
<Miss Martian aka M'gann M'orzz>,  
<Martian Manhunter aka J'onnn J'onzz>,  
<Lex Luthor aka Lex Luthor>,  
<King Kong aka King Kong>,  
<Guy Gardner aka Guy Gardner>,  
<Black Bolt aka Blackagar Boltagon>]
```

In [57]:

```
for h in session.query(Hero.name, Hero.first_appearance)[:10]:  
    print(h)
```

```
('Wonder Woman', 1941)  
( 'Wolverine', None)  
( 'Spider-Man', None)  
( 'Professor X', 1963)  
( 'A-Bomb', 2008)  
( 'Abraxas', None)  
( 'Abomination', None)  
( 'Adam Monroe', None)  
( 'Agent 13', None)  
( 'Air-Walker', None)
```


In [91]:

```
q = session.query(Hero).filter(Hero.identity == None)
q.all()
```

Out[91]:

```
[<Adam Monroe aka None>,
 <Abin Sur aka None>,
 <Angela aka None>,
 <Colin Wagner aka None>,
 <Yellow Claw aka None>,
 <Wondra aka None>,
 <White Canary aka None>,
 <Violator aka None>,
 <Vertigo II aka None>,
 <Valerie Hart aka None>,
 <Vanisher aka None>,
 <Utgard-Loki aka None>,
 <Trigon aka None>,
 <Titan aka None>,
 <Stormtrooper aka None>,
 <Stardust aka None>,
 <Steppenwolf aka None>,
 <Stacy X aka None>,
 <Spider-Woman II aka None>,
 <Snake-Eyes aka None>,
 <Skaar aka None>,
 <Shrinking Violet aka None>,
 <Rey aka None>,
 <Renata Soliz aka None>,
 <Rachel Pirzad aka None>,
 <Quantum aka None>,
 <Raphael aka None>,
 <Penance aka None>,
 <Penance I aka None>,
 <Parademon aka None>,
 <One-Above-All aka None>,
 <Nebula aka None>,
 <Nina Theroux aka None>,
 <Naruto Uzumaki aka None>,
 <Meteorite aka None>,
 <Michelangelo aka None>,
 <Mephisto aka None>,
 <Maxima aka None>,
 <Mantis aka None>,
 <Magus aka None>,
 <Man of Miracles aka None>,
 <Longshot aka None>,
 <Living Tribunal aka None>,
 <Leech aka None>,
 <Lady Bullseye aka None>,
 <Living Brain aka None>,
 <Kool-Aid Man aka None>,
 <Kilowog aka None>,
 <Junkpile aka None>,
 <K-250 aka None>,
 <Jessica Sanders aka None>,
 <Hela aka None>,
 <Granny Goodness aka None>]
```

<Gog aka None>,
<Giant-Man II aka None>,
<Forge aka None>,
<Fin Fang Foom aka None>,
<Fallen One II aka None>,
<ERG-1 aka None>,
<Elle Bishop aka None>,
<Energy aka None>,
<Donatello aka None>,
<Doppelganger aka None>,
<Destroyer aka None>,
<Demogoblin aka None>,
<Darkside aka None>,
<Darth Maul aka None>,
<Cy-Gor aka None>,
<Danny Cooper aka None>,
<Colossal Boy aka None>,
<Cat II aka None>,
<Century aka None>,
<Captain Universe aka None>,
<Captain Planet aka None>,
<Captain Midnight aka None>,
<Captain Epic aka None>,
<Cameron Hicks aka None>,
<Bumbleboy aka None>,
<Boomer aka None>,
<Bomb Queen aka None>,
<Boba Fett aka None>,
<Blue Beetle aka None>,
<Blaquesmith aka None>,
<Bolt aka None>,
<Blackout aka None>,
<Black Goliath aka None>,
<Black Flash aka None>,
<Black Abbott aka None>,
<Bird-Brain aka None>,
<Bill Harken aka None>,
<Beetle aka None>,
<Beyonder aka None>,
<Azazel aka None>,
<Atom aka None>,
<Atlas aka None>,
<Bane aka None>,
<Ares aka None>,
<Anti-Monitor aka None>,
<Ammo aka None>,
<Allan Quatermain aka None>,
<Amazo aka None>]

In [93]:

```
for h in q.all():  
    h.identity = h.name
```

In [94]:

```
session.dirty
```

Out[94]:

```
IdentitySet([<Bill Harken aka Bill Harken>, <Meteorite aka Meteorite>, <Lady Bullseye aka Lady Bullseye>, <Wondra aka Wondra>, <Michelangelo aka Michelangelo>, <Blackout aka Blackout>, <Colin Wagner aka Colin Wagner>, <Fin Fang Foom aka Fin Fang Foom>, <Boomer aka Boomer>, <Azazel aka Azazel>, <Violator aka Violator>, <Raphael aka Raphael>, <Darkside aka Darkside>, <Darth Maul aka Darth Maul>, <Bomb Queen aka Bomb Queen>, <Fallen One II aka Fallen One II>, <Mephisto aka Mephisto>, <Boba Fett aka Boba Fett>, <Atom aka Atom>, <Black Goliath aka Black Goliath>, <Beetle aka Beetle>, <White Canary aka White Canary>, <Valerie Hart aka Valerie Hart>, <Maxima aka Maxima>, <Atlas aka Atlas>, <Vanisher aka Vanisher>, <Nebula aka Nebula>, <Black Flash aka Black Flash>, <Blue Beetle aka Blue Beetle>, <Utgard-Loki aka Utgard-Loki>, <Penance aka Penance>, <Nina Theroux aka Nina Theroux>, <Bane aka Bane>, <Abin Sur aka Abin Sur>, <Kilowog aka Kilowog>, <Penance I aka Penance I>, <Angela aka Angela>, <Granny Goodness aka Granny Goodness>, <K-250 aka K-250>, <Naruto Uzumaki aka Naruto Uzumaki>, <Parademon aka Parademon>, <ERG-1 aka ERG-1>, <Black Abbott aka Black Abbott>, <Beyonder aka Beyonder>, <Ares aka Ares>, <Cy-Gor aka Cy-Gor>, <Trigon aka Trigon>, <Gog aka Gog>, <Danny Cooper aka Danny Cooper>, <Mantis aka Mantis>, <Elle Bishop aka Elle Bishop>, <Magus aka Magus>, <Blaquesmith aka Blaquesmith>, <Bird-Brain aka Bird-Brain>, <Titan aka Titan>, <One-Above-All aka One-Above-All>, <Energy aka Energy>, <Bolt aka Bolt>, <Giant-Man II aka Giant-Man II>, <Junkpile aka Junkpile>, <Captain Planet aka Captain Planet>, <Anti-Monitor aka Anti-Monitor>, <Captain Midnight aka Captain Midnight>, <Adam Monroe aka Adam Monroe>, <Stormtrooper aka Stormtrooper>, <Man of Miracles aka Man of Miracles>, <Rachel Pirzad aka Rachel Pirzad>, <Donatello aka Donatello>, <Living Brain aka Living Brain>, <Doppelganger aka Doppelganger>, <Ammo aka Ammo>, <Stardust aka Stardust>, <Quantum aka Quantum>, <Longshot aka Longshot>, <Colossal Boy aka Colossal Boy>, <Allan Quatermain aka Allan Quatermain>, <Steppenwolf aka Steppenwolf>, <Hela aka Hela>, <Vertigo II aka Vertigo II>, <Living Tribunal aka Living Tribunal>, <Captain Epic aka Captain Epic>, <Snake-Eyes aka Snake-Eyes>, <Cameron Hicks aka Cameron Hicks>, <Destroyer aka Destroyer>, <Amazo aka Amazo>, <Stacy X aka Stacy X>, <Rey aka Rey>, <Forge aka Forge>, <Demogoblin aka Demogoblin>, <Skaar aka Skaar>, <Renata Soliz aka Renata Soliz>, <Leech aka Leech>, <Cat II aka Cat II>, <Kool-Aid Man aka Kool-Aid Man>, <Century aka Century>, <Bumbleboy aka Bumbleboy>, <Spider-Woman II aka Spider-Woman II>, <Shrinking Violet aka Shrinking Violet>, <Jessica Sanders aka Jessica Sanders>, <Yellow Claw aka Yellow Claw>, <Captain Universe aka Captain Universe>])
```

In [95]:

```
session.commit()
```

In [96]:

```
q = session.query(Hero).filter(Hero.identity == None)
q.all()
```

Out[96]:

```
[]
```

In [101]:

```
new_hero = Hero(id=3000, name='New hero', identity='A new hero')
new_hero
```

Out[101]:

```
<New hero aka A new hero>
```

In [106]:

```
session.add(new_hero)
```

In [107]:

```
session.new
```

Out[107]:

```
IdentitySet([<New hero aka A new hero>])
```

In [108]:

```
session.commit()
```

In [110]:

```
[h for h in session.query(Hero).filter(Hero.name.startswith('New'))]
```

Out[110]:

```
[<New hero aka A new hero>]
```

In [111]:

```
session.delete(new_hero)
```

In [112]:

```
session.commit()
```

In [113]:

```
[h for h in session.query(Hero).filter(Hero.name.startswith('New'))]
```

Out[113]:

```
[]
```

In [114]:

```
q = session.query(Hero).filter(Hero.identity == None)  
q.all()
```

Out[114]:

```
[]
```

In []: