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from operator import itemgetter

class Schoolboy:

"""Schoolboy"""

def \_\_init\_\_(self, id, surname, mark, class\_id):

self.id = id

self.surname = surname

self.mark = mark

self.class\_id = class\_id

class Class:

"""Class"""

def \_\_init\_\_(self, id, name):

self.id = id

self.name = name

class SchoolboyClass:

"""

'Schoolboys of a Class' for implementing

many-to-many relationship

"""

def \_\_init\_\_(self, class\_id, schoolboy\_id):

self.class\_id = class\_id

self.schoolboy\_id = schoolboy\_id

classes = [

Class(1, '9A'),

Class(2, '10Б'),

Class(3, '11В'),

Class(4, '9Г'),

Class(5, '10Д'),

]

schoolboys = [

Schoolboy(1, 'Иванов', 5, 1),

Schoolboy(2, 'Петров', 4, 2),

Schoolboy(3, 'Сидоров', 3, 3),

Schoolboy(4, 'Кузнецов', 5, 4),

Schoolboy(5, 'Смирнов', 4, 5),

]

schoolboys\_classes = [

SchoolboyClass(1, 1),

SchoolboyClass(2, 2),

SchoolboyClass(3, 3),

SchoolboyClass(4, 4),

SchoolboyClass(5, 5),

SchoolboyClass(1, 2),

SchoolboyClass(2, 3),

SchoolboyClass(3, 4),

SchoolboyClass(4, 5),

SchoolboyClass(5, 1),

]

def main():

"""Main function"""

one\_to\_many = [(s.surname, s.mark, c.name)

for c in classes

for s in schoolboys

if s.class\_id == c.id]

many\_to\_many\_temp = [(c.name, sc.class\_id, sc.schoolboy\_id)

for c in classes

for sc in schoolboys\_classes

if c.id == sc.class\_id]

many\_to\_many = [(s.surname, s.mark, c\_name)

for c\_name, c\_id, s\_id in many\_to\_many\_temp

for s in schoolboys if s.id == s\_id]

print('Task B1')

res\_11 = [ (s.surname, c.name) for c in classes for s in schoolboys if s.class\_id == c.id and s.surname.endswith('ов')]

print(res\_11)

print('\nTask B2')

res\_12\_unsorted = []

for c in classes:

c\_schoolboys = list(filter(lambda i: i[2] == c.name, one\_to\_many))

if len(c\_schoolboys) > 0:

c\_marks = [mark for \_, mark, \_ in c\_schoolboys]

c\_avg\_mark = sum(c\_marks) / len(c\_marks)

res\_12\_unsorted.append((c.name, c\_avg\_mark))

res\_12 = sorted(res\_12\_unsorted, key=itemgetter(1))

print(res\_12)

print('\nTask B3')

res\_13 = sorted(many\_to\_many, key=itemgetter(0)) # Sort by schoolboy surname

print(res\_13)

if \_\_name\_\_ == '\_\_main\_\_':

main()

