**Код**

# вариант запроса Д

# вариант предметной области 11 : программа - компьютер

from operator import itemgetter

class Program:

def \_\_init\_\_(self, id, name, user, orchestra\_id):

self.id = id

self.name = name

self.user = user

self.orchestra\_id = orchestra\_id

class Сomputer:

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

self.id = id

self.name = name

class CompProg:

def \_\_init\_\_(self, comp\_id, prog\_id):

self.comp\_id = comp\_id

self.prog\_id = prog\_id

comp = [

Сomputer(1, "PC1"),

Сomputer(2, "PC2"),

Сomputer(3, "PC3"),

Сomputer(4, "PC4"),

Сomputer(5, "PC5"),

Сomputer(6, "PC6")

]

prog = [

Program(1, "Visual Studion", 10000, 1),

Program(2, "CLion", 22000, 2),

Program(3, "PyCharm CE", 45500, 2),

Program(4, "Xcode", 52000, 3),

Program(5, "WebSton", 15000, 3),

Program(6, "Atom", 100000, 3),

Program(7, "VirtualBon", 10400, 3)

]

comp\_prog = [

CompProg(1, 1),

CompProg(2, 2),

CompProg(2, 3),

CompProg(3, 4),

CompProg(3, 5),

CompProg(3, 6),

CompProg(3, 7),

CompProg(4, 1),

CompProg(5, 2),

CompProg(5, 3),

CompProg(6, 4),

CompProg(6, 5),

CompProg(6, 6),

CompProg(6, 7),

]

def main():

one\_to\_many = [(c.name, c.user, o.name)

for o in comp

for c in prog

if c.orchestra\_id == o.id]

many\_to\_many\_temp = [(o.name, co.comp\_id, co.prog\_id)

for o in comp

for co in comp\_prog

if o.id == co.comp\_id]

many\_to\_many = [(c.name, c.user, orch\_name)

for orch\_name, comp\_id, prog\_id in many\_to\_many\_temp

for c in prog if c.id == prog\_id]

print('Задание Д1')

res1 = []

for i in one\_to\_many:

if i[0][-2:] == "on":

res1.append(i[0:3:2])

print(res1)

print('\nЗадание Д2')

res2\_unsorted = []

for o in comp:

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

if len(o\_comps) > 0:

o\_user = [listeners for \_, listeners, \_ in o\_comps]

o\_user\_sum = sum(o\_user)

o\_user\_count = len(o\_user)

o\_user\_average = o\_user\_sum / o\_user\_count

res2\_unsorted.append((o.name, int(o\_user\_average)))

res2 = sorted(res2\_unsorted, key=itemgetter(1), reverse=True)

print(res2)

print('\nЗадание Д3')

res3 = {}

for o in comp:

if o.name[0] == "P":

o\_comps = list(filter(lambda i: i[2] == o.name, many\_to\_many))

o\_comps\_user = [x for x, \_, \_ in o\_comps]

res3[o.name] = o\_comps\_user

print(res3)

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

main()

**Результат**

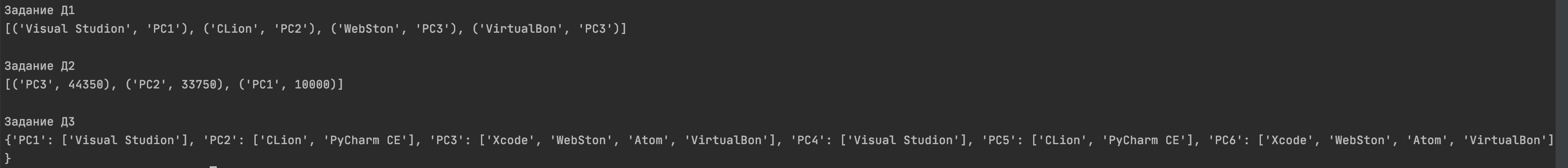
**Задание Д1**

**[('Visual Studion', 'PC1'), ('CLion', 'PC2'), ('WebSton', 'PC3'), ('VirtualBon', 'PC3')]**

**Задание Д2**

**[('PC3', 44350), ('PC2', 33750), ('PC1', 10000)]**

**Задание Д3**

**{'PC1': ['Visual Studion'], 'PC2': ['CLion', 'PyCharm CE'], 'PC3': ['Xcode', 'WebSton', 'Atom', 'VirtualBon'], 'PC4': ['Visual Studion'], 'PC5': ['CLion', 'PyCharm CE'], 'PC6': ['Xcode', 'WebSton', 'Atom', 'VirtualBon']}**