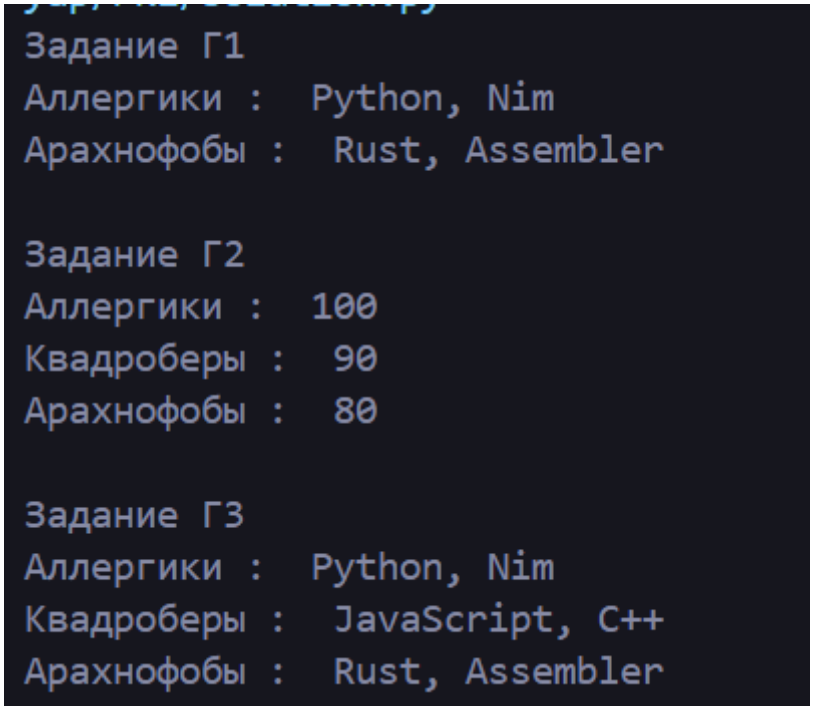
Результаты



Текст программы

```
from operator import itemgetter


class Language:
    """Язык программирования"""
    def __init__(self, id, name, popularity, library_id):
        self.id = id
        self.name = name
        self.popularity = popularity
        self.library_id = library_id


class Library:
    """Библиотека"""
    def __init__(self, id, name):
        self.id = id
        self.name = name
```

```
class LibraryLanguage:
    """
    'Языки библиотек' для реализации
    связи многие-ко-многим
    """
    def __init__(self, library_id, language_id):
        self.library_id = library_id
        self.language_id = language_id


# Библиотеки
libraries = [
    Library(1, 'Аллергики'),
    Library(2, 'Квадроберы'),
    Library(3, 'Арахнофобы'),
]


# Языки программирования
languages = [
    Language(1, 'Python', 100, 1),
    Language(2, 'Nim', 85, 1),
    Language(3, 'JavaScript', 90, 2),
    Language(4, 'C++', 75, 2),
    Language(5, 'Rust', 80, 3),
    Language(6, 'Assembler', 79, 3),
]
```

```
# Связь многие-ко-многим
libraries_languages = [
    LibraryLanguage(1, 1),
    LibraryLanguage(1, 2),
    LibraryLanguage(2, 3),
    LibraryLanguage(2, 4),
    LibraryLanguage(3, 5),
    LibraryLanguage(3, 6),
]

def main():
    # Соединение данных один-ко-многим
    one_to_many = []
    for l in libraries:
        for lang in languages:
            if lang.library_id == l.id:
                one_to_many.append((lang.name, lang.popularity, l.name))

    # Соединение данных многие-ко-многим
    many_to_many_temp = []
    for l in libraries:
        for ll in libraries_languages:
            if l.id == ll.library_id:
                many_to_many_temp.append((l.name, ll.library_id, ll.language_id))

    many_to_many = []
    for library_name, library_id, language_id in many_to_many_temp:
```

```
    for lang in languages:
        if lang.id == language_id:
            many_to_many.append((lang.name, lang.popularity, library_name))


# Задание Г1: Библиотеки, названия которых начинаются с "A", и их языки
print("Задание Г1")
g1 = []
for l in libraries:
    if l.name.startswith("A"):
        languages_list = []
        for lang in one_to_many:
            if lang[2] == l.name:
                languages_list.append(lang[0])
        g1.append((l.name, languages_list))

for library, languages_list in g1:
    print(library, ": ", ", ".join(languages_list) if languages_list else "Языков нет")

# Задание Г2: Библиотеки с максимальной популярностью языков, отсортировано по популярности
print("\nЗадание Г2")
g2 = []
for l in libraries:
    language_popularity = []
    for lang in languages:
        if lang.library_id == l.id:
            language_popularity.append(lang.popularity)
```

```
        if language_popularity:
            max_popularity = max(language_popularity)
            g2.append((l.name, max_popularity))

    g2 = sorted(g2, key = lambda x : x[1], reverse = True)

    for library, max_popularity in g2:
        print(library, ": ", max_popularity)

    # Задание Г3: Все библиотеки и их языки, сортировка по библиотекам
    print("\nЗадание Г3")
    g3 = {}
    for l in libraries:
        library_languages = []
        for lang in many_to_many:
            if lang[2] == l.name:
                library_languages.append(lang[0])
        g3[l.name] = library_languages

    for library, languages_list in g3.items():
        print(library, ": ", ", ".join(languages_list) if languages_list else "Языков нет")

if __name__ == "__main__":
    main()
```