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ИУ5-36Б

РК2

Код программы

```
from operator import itemgetter

class Chapter:
    def __init__(self, id, name):
        self.id = id
        self.name = name


class Book:
    def __init__(self, id, name, pages, chap_id):
        self.id = id
        self.name = name
        self.pages = pages
        self.chap_id = chap_id


class ChapterBook:
    def __init__(self, chap_id, book_id):
        self.chap_id = chap_id
        self.book_id = book_id


chapters = [
    Chapter(1, "Artillery Tactics"),
    Chapter(2, "Armored Vehicles"),
    Chapter(3, "Aviation"),
    Chapter(4, "Naval Strategy"),
]

books = [
    Book(1, "Tankov", 150, 2),
    Book(2, "Guns and Glory", 200, 1),
    Book(3, "Air Combat", 180, 3),
    Book(4, "Suvorov", 120, 1),
    Book(5, "Aviation History", 220, 3),
]

chapter_books = [
    ChapterBook(1, 2),
    ChapterBook(1, 4),
    ChapterBook(2, 1),
    ChapterBook(3, 3),
    ChapterBook(3, 5),
    ChapterBook(4, 2),
]
```

```python
def get_books_with_chapter_names():
    return [(book.name, chapter.name)
            for book in books
            for chapter in chapters
            if book.chap_id == chapter.id and book.name.endswith("ov")]


def get_average_pages_per_chapter(chapters):
    averages = []
    for chapter in chapters:
        total_pages = sum(chapter.pages)  # Ensure this sums correctly
        average = total_pages / len(chapter.pages) if chapter.pages else 0
        averages.append((chapter.name, average))
    print(f"Calculated averages: {averages}")  # Debug output
    return averages



def get_chapters_starting_with_a():
    result = []
    for chapter in chapters:
        if chapter.name.startswith("A"):
            books_in_chapter = [book.name for book in books if book.chap_id ==
chapter.id]
            result.append((chapter.name, books_in_chapter))
    return result


# Main function
def main():
    print("Задание 1: Список книг, название которых заканчивается на 'ов', и их
главы:")
    print(get_books_with_chapter_names())

    print("\nЗадание 2: Список глав со средней длиной книг в страницах,
отсортированный по средней длине:")
    print(get_average_pages_per_chapter())

    print("\nЗадание 3: Список глав, название которых начинается с 'A', и книги,
относящиеся к ним:")
    print(get_chapters_starting_with_a())


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

Экран вывода

```
[Running] python -u "C:\Users\bumag\AppData\Local\Temp\tempCodeRunnerFile.python"
???????? 1: ??????? ????, ????????? ???????? ????????????? ?? '??', ? ?? ??????:
[('Tankov', 'Armored Vehicles'), ('Suvorov', 'Artillery Tactics')]

???????? 2: ??????? ???? ?? ???????? ??????? ????? ? ??????????, ?????????????????? ?? ???????? ??????:
Calculated averages: [('Artillery Tactics', 160.0), ('Armored Vehicles', 150.0), ('Aviation', 200.0), ('Naval Strategy', 0)]
[('Artillery Tactics', 160.0), ('Armored Vehicles', 150.0), ('Aviation', 200.0), ('Naval Strategy', 0)]

???????? 3: ??????? ????, ????????? ???????? ?????????? ? '?', ? ??????, ??????????? ? ???:
[('Artillery Tactics', ['Guns and Glory', 'Suvorov']), ('Armored Vehicles', ['Tankov']), ('Aviation', ['Air Combat', 'Aviation History'])]

[Done] exited with code=0 in 0.095 seconds

[Running] python -u "C:\Users\bumag\AppData\Local\Temp\tempCodeRunnerFile.python"
???????? 1: ??????? ????, ????????? ???????? ????????????? ?? '??', ? ?? ??????:
[('Tankov', 'Armored Vehicles'), ('Suvorov', 'Artillery Tactics')]

???????? 2: ??????? ???? ?? ???????? ??????? ????? ? ??????????, ????????????????? ?? ???????? ??????:
Calculated averages: [('Artillery Tactics', 160.0), ('Armored Vehicles', 150.0), ('Aviation', 200.0), ('Naval Strategy', 0)]
[('Artillery Tactics', 160.0), ('Armored Vehicles', 150.0), ('Aviation', 200.0), ('Naval Strategy', 0)]

???????? 3: ??????? ????, ????????? ???????? ?????????? ? '?', ? ??????, ??????????? ? ???:
[('Artillery Tactics', ['Guns and Glory', 'Suvorov']), ('Armored Vehicles', ['Tankov']), ('Aviation', ['Air Combat', 'Aviation History'])]

[Done] exited with code=0 in 0.101 seconds
```