[CS 11 25.1] Lab 3b – Compatibility 2

Cheatsheet is available here: https://oj.dcs.upd.edu.ph/cs11cheatsheet/

Submit solution [CS 11 25.1] Lab Exercise 3

Points: 120 (partial)
Time limit: 15.0s
Memory limit: 2G

Problem type

Allowed languages
py3

Problem Statement

There are n intervals, numbered 1 to n. You are also given an integer m.

For each integer k such that $0 \leq k < m$, answer the following question:

How many pairs of integers (i, j) are there with $1 \leq i < j \leq n$ such that intervals i and j have an intersection of length k? Two intervals have an intersection of length k if there are exactly k unique integers that are in both intervals.

Note. An *interval* is given in the form $[\ell, r)$, which consists of all integers x such that $\ell \leq x < r$.

Task Details

Your task is to implement a function named `intersection_stats`, which should have the following *signature*:

```
def intersection_stats(intervals, m):
```

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The above says that it has two arguments `intervals` and m.

- `intervals` is a length-n `tuple` of pairs (tuples of length 2) denoting the n intervals.
- m is an integer (`int`) as described in the **Problem Statement**.

The function must return a length-m list of integers, where the i^{th} item in this list (0-indexed) refers to the answer when $k = i$.

Restrictions

- Your source code must have at most $1{,}000$ bytes.
- The following symbol is allowed: `sorted`.

Examples

Example 1 Function Call

```
intersection_stats(((1, 3), (2, 4), (1, 5)), 4)
```

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Example 1 Return Value

```
[0, 1, 2, 0]
```

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Constraints

- The function `intersection_stats` will be called at most 100 times.
- $0 \leq \ell < r \leq 10^{20}$
- The length of `intervals` is at most 100.
- $1 \leq m \leq 50$

Scoring

Note: New tests may be added and all submissions may be rejudged at a later time. (All future tests will satisfy the constraints.)

- You get 20 ❤ points if you solve all test cases where:
  - $r \leq 50$
- You get 100 ❤ points if you solve all test cases.

Clarifications

Report an issue

No clarifications have been made at this time.