[CS 11] Prac 8e – Match Making

Problem Statement

Two Esports teams specializing in the popular MOBA game Protection of the Ancients have decided to hold a joint training session!

Each team consists of individual players with varying skill levels.

Even though the game is team-based, this particular training will focus on one-on-one combat. So the plan is for a player from one team to get matched with a player from the other team.

Furthermore, for the training to be effective, the difference between the skill levels of both members must be at most 1. Finally, each player can only participate in at most one match for this training.

You can choose who to pair up with whom, as long as they satisfy the requirements above. If you choose the match-ups optimally, what is the maximum number of matches you can set?

Task Details

Your task is to implement a function called `max_matches`. This function has two parameters, each of which is a `tuple` of `int`s representing the skill levels of an Esports team.

The function must return an `int` denoting the maximum number of matches you can set.

Restrictions

(See 8a for more restrictions)

For this problem:

- Loops and lists are allowed.
- Up to 8 function definitions are allowed.
- Recursion is **disallowed**. (The recursion limit has been greatly reduced.)
- Sets and dictionaries are allowed.
- Generators and comprehensions are allowed.
- The source code limit is 600.

Example Calls

Example 1 Function Call

```
max_matches(
    (5, 1, 3),
    (2, 2, 2, 2, 2),
)
```

Example 1 Return Value

```
2
```

Example 2 Function Call

```
max_matches(
    (2, 7, 1, 8, 2, 8, 1, 8, 4),
    (3, 1, 4, 1, 5, 9),
)
```

Example 2 Return Value

```
5
```

Constraints

- The function `max_matches` will be called at most $60{,}000$ times.
- The total number of players across all calls will be at most $200{,}000$.
- The total number of players in each call will be at most $200{,}000$.
- Each skill level is an integer betwee 0 and 10^{10}.

Scoring

- You get 30 ❤️ points if you solve all test cases where:
  - the total number of players in each call is ≤ 50.
  - the total number of players across all calls is at most 500.
- You get 30 ❤️ points if you solve all test cases where:
  - the total number of players in each call is $\leq 4{,}000$.
  - the total number of players across all calls is at most $8{,}000$.
- You get 120 ❤️ points if you solve all test cases.

Submit solution [CS 11] Practice 8

Points: 180 (partial)
Time limit: 4.0s
Memory limit: 1G

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Problem type

Allowed languages ~~NONE~~, py3

Clarifications

Report an issue

No clarifications have been made at this time.