

## Homework #5

# Bar Brawl

## Problem

### Description

You are the proprietor of an establishment that sells beverages of an unspecified, but delicious, nature. The establishment is frequented by a set  $P$  of patrons. One of patron is the instigator and another is the peacemaker.

On a given evening, a subset  $S \subseteq P$  is present at the establishment. If the instigator is in  $S$  but the peacemaker is not in  $S$ , then a fight will break out. If the instigator is not in  $S$  or if the peacemaker is in  $S$ , then no fight will occur.

Your goal is to predict whether a fight will break out among a subset of the patrons without initially knowing the identity of the instigator or the peacemaker.

### Procedure

Develop a KWIK learner for this problem. When presented with  $S$ , the patrons at the establishment, your learner will respond with "FIGHT", "NO FIGHT", or "I DON'T KNOW". Additionally, it should be capable of learning from the tuple of  $S$  and the true outcome for the evening.

For each problem, the following input will be given:

```
atEstablishment : boolean[0..numberOfEpisodes][0..numberOfPatrons]
fightOccured : boolean[0..numberOfEpisodes]
```

Specifically:

- For each episode, you should present your learner with the next row of `atEstablishment` and the corresponding row of `fightOccured`.
- If your learner returns "FIGHT" or "NO FIGHT", you may continue on to next episode.
- If your learner returns "I DON'T KNOW", then you should present the pair `(atEstablishment, fightOccured)` to you learner to learn from.

You will submit a list of strings of the output of from you learner each time it is presented with an episode.

## Example

The test case will be considered successful if no wrong answers are returned and number of "I DON'T KNOW" does not exceed the max allowed.

```
boolean[][] atEstablishment = {
```

```
    {true,true},
```

```
    {true,false},
```

```
    {false,true},
```

```
    {true,true},
```

```
    {false,false},
```

```
    {true,false},
```

```
    {true,true}
```

```
};
```

```
boolean[] fightOccurred = {
```

```
    false,
```

```
    true,
```

```
    false,
```

```
    false,
```

```
    false,
```

```
    true,
```

```
    false
```

```
};
```

Output: No incorrect answers and only 1 "I DON'T KNOW"

0, -1, 0, 0, 0, 1, 0

**KEY for output**

0 = NO FIGHT

-1 = I DON'T KNOW

1 = FIGHT

## Resources

The concepts explored in this homework are covered by:

- Readings
  - Li, Littman, Walsh (2008)

## Submission Details

Due Date: **July 8, 2018 (AOE/UTC-12)**

To complete assignment calculate answers to the specific values given and submit results at

<https://rldm.herokuapp.com>

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