Solution Review: Predicting Election Results

This lesson discusses the solution review to predicting election results.

WE'LL COVER THE FOLLOWING

- Solution 1
  - Explanation
- Solution 2
  - Explanation

Solution 1

```
import numpy as np
import numpy.random as rnd

rnd.seed(2)
people = np.zeros(1000000, dtype='int')  # arthur is 0
people[490001:] = 1  # ben is 1
poll = rnd.choice(people, 1000)

polled_for_arthur = len(poll[poll == 0])

print('polled for A:', polled_for_arthur)
if polled_for_arthur > 500:
    print('Octavius will predict the wrong winner')
else:
    print('Octavius will predict the correct winner')
```

Explanation

- In line 5, we have created an array of zeros of length `1000000`. We then replace the last `510000` zeros with `1`.
- In line 7, we randomly choose `1000` elements from `people` using the method `choice` and store it in `poll`.

- In line 9, we compute the total number `0`s in `poll` to compute the number of people who voted for Arthur.
- Since the number of `0`'s in `poll` turns out to be greater than 500, they misrepresent the actual outcome.

Solution 2

```
import numpy as np
import numpy.random as rnd

rnd.seed(2)

arthur_wins = 0
ben_wins = 0

for i in range(1000):
  people = np.zeros(1000000, dtype='int')  # Arthur is 0
  people[490001:] = 1  # Ben is 1
  poll = rnd.choice(people, 1000)
  polled_for_arthur = len(poll[poll ==  0])

  if polled_for_arthur > 500:
    arthur_wins += 1
  else:
    ben_wins += 1

print('1000 polls of 1000 people')
print('Probability that Octavius predicts correct winner:', (ben_wins / 1000))
```

Explanation

- The code above is similar to the code in solution 1, except that we run the code for `1000` times, using a `for` loop, in lines 9 - 18.
- For every loop, we use the `if` condition in line 15 to check whether Octavius predicted the right result or not.
- Depending on the value of `polled_for_arthur`, we store the result in either `arthur_wins` or `ben_wins`
- In line 21, we compute the probability that Octavius predicted the correct winner in 1000 polls of 1000 people

winner in 1000 polls of 1000 people.

With this solution review, we are done with the random variables chapter. Let's move on to the applications part of the course.