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Problem 6

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Problem 6

20/20 points (graded)

Write a function that meets the specifications below. You do not have to use dynamic programming.

Hint: You might want to use `bin()` on an int to get a string, get rid of the first two characters, add leading 0's as needed, and then convert it to a numpy array of ints. Type `help(bin)` in the console.

For example,

- If `choices = [1,2,2,3]` and `total = 4` you should return either `[0 1 1 0]` or `[1 0 0 1]`
- If `choices = [1,1,3,5,3]` and `total = 5` you should return `[0 0 0 1 0]`
- If `choices = [1,1,1,9]` and `total = 4` you should return `[1 1 1 0]`

More specifically, write a function that meets the specifications below:

```
def find_combination(choices, total):  
    """  
    choices: a non-empty list of ints  
    total: a positive int  
  
    Returns result, a numpy.array of length len(choices)  
    such that  
        * each element of result is 0 or 1  
        * sum(result*choices) == total  
        * sum(result) is as small as possible  
    In case of ties, returns any result that works.  
    If there is no result that gives the exact total,  
    pick the one that gives sum(result*choices) closest  
    to total without going over.  
    """
```

Paste your entire function (including the definition) in the box.

Note: If you want to use numpy arrays, you should add the following 3 lines before your code:

```
import os  
os.environ["OPENBLAS_NUM_THREADS"] = "1"  
import numpy as np
```

And use `np.METHOD_NAME` in your code. Unfortunately, `pylab` does not work with the grader.

```
1 import numpy as np  
2 import itertools  
3  
4 def find_combination(choices, total):  
5     """  
6     choices: a non-empty list of ints  
7     total: a positive int  
8  
9     Returns result, a numpy.array of length len(choices)  
10    such that  
11        * each element of result is 0 or 1  
12        * sum(result*choices) == total  
13        * sum(result) is as small as possible  
14    In case of ties, returns any result that works.  
15    If there is no result that gives the exact total,
```

Press ESC then TAB or click outside of the code editor to exit

Correct

 Calculator

CORRECT

[See full output](#)

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