Sparta Programming Challenge

Bet calculator problem

Description

Tote betting involves betters choosing the outcome of a race by placing bets into a pool of money. Betters who successfully predict the outcome of a race take a share of the pool proportional to their stake, i.e. a better who places a $2 bet on a winning selection would receive twice the winnings of a better who placed a $1 bet. The betting company takes a commission out of the pool before it is split between winning betters.

The calculator must support four products with the following rules:

WIN

- Betters must choose the winner of a race
- The betting company takes a 15% commission from the Win pool
- The remaining total is split, proportionally to stake, amongst betters who chose the correct winning horse.

PLACE

- Betters must choose the first, second or third place horse in a race
- The betting company takes a 12% commission from the Place pool
- The total pool is split evenly into 3 and each of these amounts is then split, proportionally to stake, amongst the betters who chose each placed horse.

EXACT

- Betters must choose the first and second place runners in a race in the correct order
- The betting company takes an 18% commission from the Exact pool
- The remaining total is split, proportionally to stake, amongst betters who chose the correct first and second horse in correct order.

QUINELLA

- Betters must choose the first and second place runners in a race in **ANY** order
- The betting company takes an 18% commission from the Quinella pool

- The remaining total is split, proportionally to stake, amongst betters who chose the correct first and second horse in **ANY** order.

After a race has been run, the betting company publishes the dividends for each product. This is the return for a $1 stake for each paying selection in the race. All dividends are calculated to the nearest $0.01.

Input - Bets

Your program should take as input the list of bets placed on a race. The format of the bet is:

<Product>:<Selection(s)>:<Stake> where

<Product> is one of W,P,E,Q
<Selection> is a single runner number (e.g. 4) for Win and Place or 2 runner numbers (e.g. 4,3) for Exact and Quinella
<Stake> is in whole dollars (e.g. 35)

So the following would be examples:

- ‘W:3:5’ is a $5 bet on horse 3 to win
- ‘P:2:10’ is a $10 bet on horse 2 to come first, second or third
- ‘E:5,7:15’ is a $15 bet on horses 5 and 7 to come first and second in that order
- ‘Q:3,9:20’ is a $20 bet on horses 3 and 9 to come first and second in any order

Input - Result

Your program should also take as input the results of a race in the following format:

R:<first><second><third>

So the following input would represent a race where horse 5 finished first, horse 3 finished second and horse 8 finished third:

R:5:3:8

Output - Dividends

When bets have been placed and results provided, your program should generate the dividends for each product for a race.

Problem

Given the following bets:

W:1:3	P:1:31	E:1,2:13	Q:1,2:19
W:2:4	P:2:89	E:2,3:98	Q:2,3:77
W:3:5	P:3:28	E:1,3:82	Q:1,3:26
W:4:5	P:4:72	E:3,2:27	Q:2,4:63
W:1:16	P:1:40	E:1,2:5	Q:1,2:66
W:2:8	P:2:16	E:2,3:61	Q:2,3:82
W:3:22	P:3:82	E:1,3:28	Q:1,3:90
W:4:57	P:4:52	E:3,2:25	Q:2,4:48
W:1:42	P:1:18	E:1,2:81	Q:1,2:18
W:2:98	P:2:74	E:2,3:47	Q:2,3:93
W:3:63	P:3:39	E:1,3:93	Q:1,3:62
W:4:15	P:4:105	E:3,2:51	Q:2,4:25

And the following results:

R:2:3:1

Show that the dividends would be calculated as follows:

Win - Runner 2 - $2.61
Place - Runner 2 - $1.06
Place - Runner 3 - $1.27
Place - Runner 1 - $2.13
Exact - Runners 2,3 - $2.43
Quinella - Runners 2,3 - $2.18

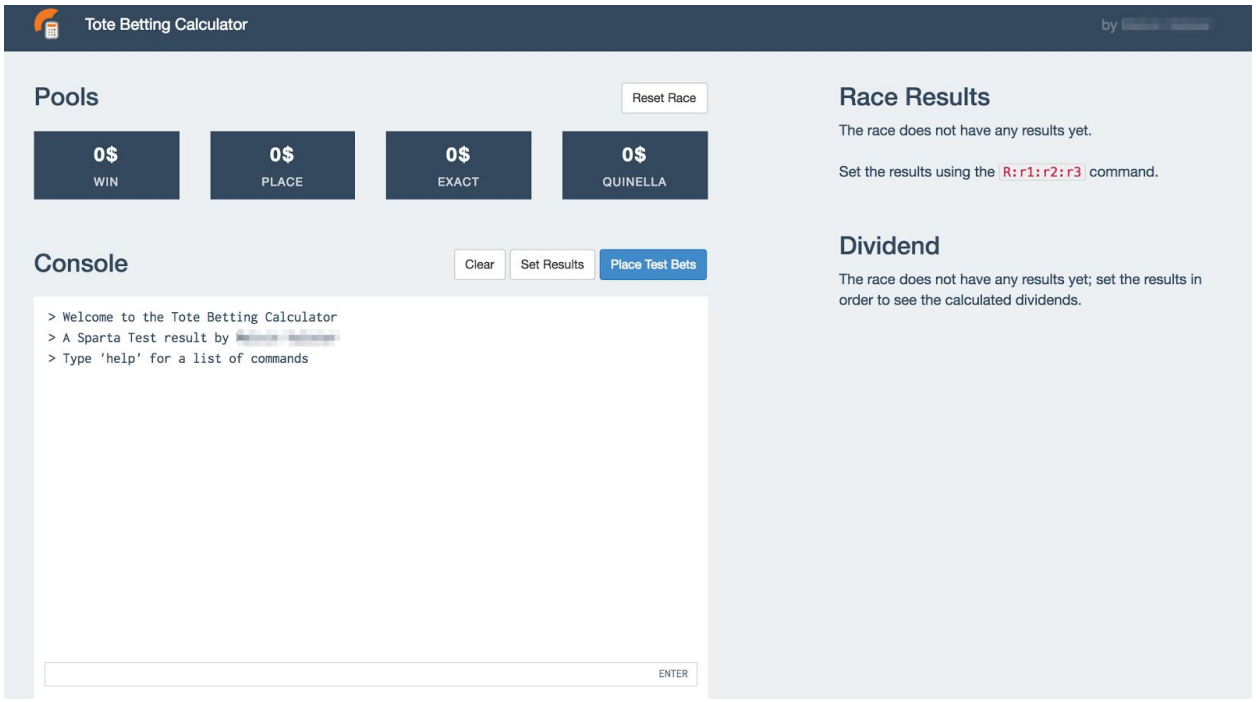
Requirement:

1. Your program should get the right dividends with given inputs
2. Your language of choice can be any flavour of Javascript
3. The commission rate should be adjustable for each product

4. Wrong input should detected and logged
5. Please include a short instruction how to run your program
6. Add a UI layer with React
7. Bonus: Add unit test cases

Design suggestion

Below is a suggestion for UI that you can use as inspiration. Feel free to experiment and add your own twist to it.



Questions and submission

Please submit your solution and any questions in an email to Anders Hassis (anders@spartasales.com) and Yi Fu (yi@spartasales.com)