cp9_assignment_instructions

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CP 9 Assignment

Probability Simulation

Exercise 1 - Batting Series

Write a function to model the at bat record of some baseball player during some game.

Your function should take a vector of probabilities as input, the vector should give the probability that the batter is out, gets to 1st, 2nd, then 3rd, and finally hits a homerun. EX `c(0.5,0.25,0.1,0.1,0.05)`.

Ensure your function will only run with an appropriate vector of probabilities. (`lenght(probs) == 5 & sum(probs) == 1`) Some rudimentary research provided that on average a player gets 2.73 at-bats per game, with a maximum of 8 at bats, last achieved by Barry McCormick in 1897. To model this, your function should make a draw from a poisson distribution, with lambda = 2.73. Use the `floor` or `ceiling` function to make your draw countable and ensure that out player is at-bat at least once and no more than 8 times.

Next, use a draw from the uniform distribution and the input vector of probabilities to simulate the result of each of the player's at-bats.

Return your vector of results s.t. `out = 0, 1st = 1, 2nd = 2, 3rd = 3, and homerun = 4`.

EX: `1 1 0 0 0 2 4`

```
battingSeries <- function(bProbs){}
```

Exercise 2

Write a function called `diceRollin` that will simulate some number of sums of some number of 6-sided dice rolls.

Your function should use as input:

- a vector of probabilities about a 6-sided dice, each entry the probability of landing on each side, 1,2,3,...,6, EX `evenDice <- rep(1/6, 6)`

- an integer, `sums`, indicating a number of trials, set this to 10 by default

- another integer, `numDice`, indicating how many dice rolls will make up each sum, set this to 4 by default.

Your function should return a vector of sums, with length `sums`, where each entry is the sum of rolling `numDice` number of 6-sided dice with the input probabilities.

Example output: `10 9 14 13 13 15 5 8 8 15`

```
diceRollin <- function(diceProbs, sums = 10, numDice = 4) {}
```