Exercise: Rolling a Fair Six-Sided Die

(3/3 points)

- We roll a fair six-sided die with faces 1 through 6. Which of the following are valid sample spaces to describe the experiment of rolling this die? (We are expressing the sample space as a Python set. You may select more than one answer.)

  - [x] {'1','2','3','4','5','6'} ✔
  - [x] {1,2,3,4,5,6} ✔
  - [x] {'roll 1','roll 2','roll 3','roll 4','roll 5','roll 6'} ✔

  ✔

- Choosing a valid sample space from the previous part, what is the probability of each possible outcome?

  1/6 ✔ **Answer:** 1/6

- Suppose we use the sample space `{1,2,3,4,5,6}`. Write the Python dictionary that encodes a valid probabilistic model for the fair die roll experiment using this sample space. (Your answer should be the Python dictionary itself, and *not* the dictionary assigned to a variable, so please do not include, for instance, "`model =`" before specifying your answer. You can use fractions. If you use decimals instead, please be accurate and use at least 5 decimal places.)

{1: 0.16666666666666(✔ **Answer:** {1:1./6.,2:1./6.,3:1./6.,4:1./6.,5:1./6.,6:1./6.}

Solution:

- We roll a fair six-sided die with faces 1 through 6. Which of the following are valid sample spaces to describe the experiment of rolling this die? (We are expressing the sample space as a Python set. You may select more than one answer.)

  All the choices are valid. How a sample space is chosen is not unique. As a more involved example, we could even have a sample space that consists of two fair six-sided dice being thrown, where we basically discard all the information about the second die's outcome to reason about the first die. We could also add junk outcomes that are assigned probability 0. However, in general, it's best to keep the sample space as simple as possible to solve the problem at hand.

- Choosing a valid sample space from the previous part, what is the probability of each possible outcome?

  Each of the six faces are equally likely occurring with probability **1/6**.

- Suppose we use the sample space `{1,2,3,4,5,6}`. Write the Python dictionary that encodes a valid probabilistic model for the fair die roll experiment using this sample space. (Your answer should be the Python dictionary itself, and *not* the dictionary assigned to a variable, so please

do not include, for instance "`model =`" before specifying your answer. Also please be accurate with your fractions up to 5 decimals.)

Assign each outcome probability 1/6: **{1: 1/6, 2: 1/6, 3: 1/6, 4: 1/6, 5: 1/6, 6: 1/6}**

You have used 4 of 5 submissions