Q1. What is a probability distribution, exactly? If the values are meant to be random, how can you predict them at all?

Ans : A probability distribution is a list of all of the possible outcomes of a random variable, along with its corresponding probability values. A probability distribution links each outcome of a random variable or process with its probability of occurrence.

Q2. Is there a distinction between true random numbers and pseudo-random numbers, if there is one? Why are the latter considered “good enough”?

* Ans : If you’re writing a video game and you want to decide whether the bad guy shoots and hits the player or shoots and misses or doesn’t shoot at all - then a pseudo-random number is just fine. Nobody really cares whether it’s statistically valid or not - and (typically) you can generate a pseudo-random number much more rapidly than a truly random number. So for this use-case, either would work - but pseudo-random is faster, so that’s what we do.
* If you’re writing a physics simulation - then you might want good quality pseudo-random numbers - but you don’t want TRUE randomness because you may want to re-run the simulation with slightly different conditions but with the same exact random numbers. So in this case, you REALLY want pseudo-randomness and true random numbers would be a terrible choice.
* If you’re writing a security package where random numbers are used to generate software locks and keys - then pseudo-random numbers are a bad idea because the bad guy might be able to figure out what key you’re going to generate next by observing the past few keys that you generated. So in this case, you definitely want true randomness if you can get it.

Q3. What are the two main factors that influence the behaviour of a "normal" probability distribution?

Ans : All forms of (normal) distribution share the following characteristics:

* It is symmetric. A normal distribution comes with a perfectly symmetrical shape. ...
* The mean, median, and mode are equal. ...
* Empirical rule. ...
* Skewness and kurtosis.

Q4. Provide a real-life example of a normal distribution.

Ans : Rolling A Dice

A fair rolling of dice is also a good example of normal distribution. In an experiment, it has been found that when a dice is rolled 100 times, chances to get '1' are 15-18% and if we roll the dice 1000 times, the chances to get '1' is, again, the same, which averages to 16.7% (1/6).

Q5. In the short term, how can you expect a probability distribution to behave? What do you think will happen as the number of trials grows?

Ans : The probabilities in the probability distribution of a random variable X must satisfy the following two conditions: Each probability P(x) must be between 0 and 1: 0≤P(x)≤1. The sum of all the probabilities is 1: ΣP(x)=1.

Q6. What kind of object can be shuffled by using random.shuffle?

Ans : shuffle() shuffles a list in place

Q7. Describe the math package's general categories of functions.

Ans :

|  |  |
| --- | --- |
| Based on Elements | One-One Function Many-One Function Onto Function One-One and Onto Function Into Function Constant Function |
| Based on the Equation | Identity Function Linear Function Quadratic Function Cubic Function Polynomial Functions |

Q8. What is the relationship between exponentiation and logarithms?

Ans : Logarithmic functions are the inverses of exponential functions. The inverse of the exponential function y = ax is x = ay. The logarithmic function y = logax is defined to be equivalent to the exponential equation x = ay. y = logax only under the following conditions: x = ay, a > 0, and a≠1.

Q9. What are the three logarithmic functions that Python supports?

Ans : log2(x) log(x, Base) log10(x) log1p(x)