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:

Pseudorandom Number Generation. Software-generated random numbers only are pseudorandom. They are not truly random because the computer uses an algorithm based on a distribution, and are not secure because they rely on deterministic, predictable algorithms.

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

ANS:

The normal distribution is a continuous probability distribution that is symmetrical around its mean, most of the observations cluster around the central peak, and the probabilities for values further away from the mean taper off equally in both directions. Extreme values in both tails of the distribution are similarly unlikely. While the normal distribution is symmetrical, not all symmetrical distributions are normal. For example, the Student’s t, Cauchy, and logistic distributions are symmetric.

As with any probability distribution, the normal distribution describes how the values of a variable are distributed. It is the most important probability distribution in statistics because it accurately describes the distribution of values for many natural phenomena. Characteristics that are the sum of many independent processes frequently follow normal distributions. For example, heights, blood pressure, measurement error, and IQ scores follow the normal distribution.

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

ANS:

The height of people is an example of normal distribution. Most of the people in a specific population are of average height. The number of people taller and shorter than the average height people is almost equal, and a very small number of people are either extremely tall or extremely short.

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:

A probability distribution depicts the expected outcomes of possible values for a given data generating process. Probability distributions come in many shapes with different characteristics, as defined by the mean, standard deviation, skewness, and kurtosis.

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

ANS:

The shuffle() method in the random module is used to shuffle a list. It takes a sequence, such as a list, and reorganizes the order of the items. This shuffle() method changes the original list, it does not return a new list.

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

ANS:

Constant Function: The polynomial function of degree zero. Linear Function: The polynomial function of degree one. Quadratic Function: The polynomial function of degree two. Cubic Function: The polynomial function of degree three.

Q8. What is the relationship between exponentiation and logarithms?

ANS:

The logarithmic function can be understood as the inverse of exponentiation, and can be defined when the power of certain numbers is raised in order to get another number. For example: log28 = 3. Ans. The standard form of exponential is ax = N which can be written in logarithmic function form as logaN = x .

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

ANS:

The following are the variants of the basic log function in Python:

* log2(x)
* log(x, Base)
* log10(x)
* log1p(x)