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

- Definition: A probability distribution describes how the likelihood of different outcomes is spread.

- Random Values: Although the values may seem random, the distribution provides a predictive framework.

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

- Distinction: True random numbers are generated from unpredictable physical processes, while pseudo-random numbers are deterministically generated.

- Pseudo-Random Numbers: Considered "good enough" for most practical applications, as they exhibit statistical properties similar to true randomness.

3. Factors Influencing Normal Probability Distribution:

- Mean (μ): Central tendency or average.

- Standard Deviation (σ): Measure of data spread.

4. Real-Life Example of Normal Distribution:

- Example: Human height often follows a normal distribution.

5. Short Term Behaviour vs. Long Term Behaviour:

- Short Term: Deviations from expected behaviour.

- Long Term: As the number of trials grows, the distribution converges toward the expected behaviour due to the Law of Large Numbers.

6. Objects Shuffled by random.shuffle:

- List: The `random.shuffle` function shuffles a list in-place.

7. General Categories of Functions in the math Package:

- Basic Functions: Trigonometric, logarithmic, exponential, etc.

- Constants: Mathematical constants like π (pi) and e.

8. Relationship Between Exponentiation and Logarithms:

- Relationship: Logarithm is the inverse operation of exponentiation. If \(a^b = c\), then \(\log\_a(c) = b\).

9. Three Logarithmic Functions in Python:

- math.log(x[, base]): Natural logarithm (base e).

- math.log10(x): Logarithm base 10.

- math.log2(x): Logarithm base 2.