1. Question — The situation: "You invest everything in one stock. One year later you have either the same/more money or you lost some" can be modeled by which distribution?

Answer : One trial and two possible outcomes: Bernoulli Distribution

2. Question — Provide the pmf for the above statement:

Answer :

$$f(\text{Lose money}, p) = \begin{cases} p & \text{if you lose money,} \\ q = 1 - p & \text{if you do not lose money.} \end{cases}$$

3. Question — According to statista (https://www.statista.com/statistics/1126823/worldwide-developer-gender/), roughly 92% of the worldwide software engineers are male. What is the probability that if you select 10 software engineers at random, there are exactly 9 males? What is the probability that there more or less than 9 males?

Answer :

1. This is an example for the binomial distribution. A software engineer is either male or not male.
2. PMF: $P(k, n, p) = P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}$
3. PMF: $P(X = 9) = \binom{10}{9} 0.92^9 (1 - 0.92)^1 = 0.378$
4. The probability that tere are more or less than 9 males is 1-0.378 = 0.622

4. Question — Which distribution can be used to model the following statement: "The number of low and high performers in a company within 52 week interval"?

Answer : Poisson Distribution