1. Question — Given 100 coin tosses. 40 show head and 60 tail. Can you state that P(head) = 0.4?

2. Question — How often would you need to throw the coin to be certain that P(head)=0.4? How often if you just want to be "very sure"? What is the underlying rule?

3. Question — You have $10,000 to invest in three companies.
Company 1 yields 99% with a chance of 10%.
Company 2 yields 10% 99% of the time.
Company 3 yields 1000% 1% of the time.
a) What is the probability that all companies make profit?
b) What is the expected return of company 1 when investing $10,000?
c) What is the probability that no company makes profit?
d) What is the probability that only company 1 makes profit?

4. Question — A new virus is spreading! Already 10,000 people are infected (out of 335,000,000). Luckily, a new rapid test is available which has a true positive and true negative rate of 99%. Unfortunately your test is positive now! What is the probability that you are infected?