Suppose that X and Y are independent random variables and have PMF P(X=1)=P(Y=1)=0.1, P(X=2)=P(Y=2)=0.2, P(X=3)=P(Y=3)=0.3, P(X=4)=P(Y=4)=0.4. Compute P(X+Y≥7). Write a Matlab simulation and compare its results against your calculations.

A bit string of length 10 is sent across a lossy link. Each bit is corrupted independently with probability 0.1. What is the probability that there are at least 3 bit errors ? Write a Matlab simulation and check its results against your calculations.

Consider a computer that has two operating systems installed on it. Let X and Y be the number of times the computer freezes in a day when it runs on the first and second operating systems respectively. The following reports the probability of different numbers of freezes.

	Y=0	Y=1	Y=2
X=0	0.5	0.05	0.12
X=1	0.10	0.07	0.01
X=2	0.08	0.06	0.01

Are X and Y independent ? Let Z=XY. Find the PMF of Z.

5% of coins are not fair, with probability 0.2 of coming up heads. We toss a coin 10 times and observe less than 3 heads. What is the probability that the coin is not fair ? Suppose that only 1% of coins are not fair, what is the probability now ?