

Time Series Prequiz

Below, you should try to do all the calculations by hand or with a non-programmable calculator.

Question 1:

Suppose X is a random variable with probability function

$$\mathbb{P}(X = x) = \begin{cases} 0.3 & x = -1 \\ 0.4 & x = 0 \\ 0.3 & x = 1 \end{cases}$$

- a) Calculate the expectation of X .

- b) Calculate the expectation of X^2 .

- c) Calculate the variance of X .

Question 2

Suppose X, Y are random variables with probability function

$$\mathbb{P}(X = x, Y = y) = \begin{cases} 0.2 & x = 0, y = 0 \\ 0.3 & x = 1, y = 0 \\ 0.3 & x = 0, y = 1 \\ 0.2 & x = 1, y = 1 \end{cases}$$

- a) Calculate $\mathbb{P}(X = 1|Y = 0)$.

- b) (Optional) Calculate the expectation of $X + Y$ conditional on $Y = y$.