

# Chapter 2 Probability Distributions

## 1 Exercise 2.1

By Bernulli distribution defination, we have

$$\sum_{x_i=0,1} p(x_i|\mu) = \mu + (1 - \mu) = 1 \quad (1)$$

By expectation defination, we have

$$E[x] = \sum_{x_i=0,1} x_i p(x_i|\mu) = 0 * (1 - \mu) + 1 * \mu = \mu \quad (2)$$

By variance defination, we have

$$Var[x] = \sum_{x_i=0,1} (x_i - E[x])^2 p(x_i|\mu) \quad (3)$$

$$= \mu^2(1 - \mu) + (1 - \mu)^2\mu \quad (4)$$

$$= \mu(1 - \mu) \quad (5)$$

## 2 Exercise 2.2

TO DO