Weekly Assignment 10

Due date: 2020-11-23, 23:59 UTC

Page 11: Data Compression-2 (Unit 10) and Data Compression-3 (Unit 11)

1. Suppose that $p_r = (p_1, \ldots, p_n)$ is distributed on $\mathbb{R}^n$ where $P_r = \text{Bern}(\theta)$, where $\mathbf{P}(\mathbf{X} | \mathbf{Y})$ denotes the number of terms in $\mathbf{Y}$. What is the expected value of $\mathbf{P}(\mathbf{X} | \mathbf{Y})$?

2. A random variable $X$ is uniformly distributed on $[0, 1]$. What is the expected value of $X^2$?

3. Suppose $X, Y, Z$ are independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2 + Z^2$?

4. Suppose $X, Y$ are independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

5. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

6. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

7. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

8. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

9. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

10. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

11. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

12. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?

13. Let $X$ and $Y$ be independent random variables, each uniformly distributed on $[0, 1]$. What is the expected value of $X^2 + Y^2$?