Assignment 11

The due date for submitting this assignment has passed.

Due on 2021-07-04, 23:59 IST.

1. For numerical answers with decimal digits please real instructions on recording off. For boolean questions please answer Yes or No.

   a. Let $x$ and $y$ be two independent random variables, $x$ and $y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   0 & \text{if } 0 \leq z < 1, \\
   \frac{z}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

   b. Let $X$ and $Y$ be two independent random variables and $Z = X + Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } 0 \leq z < 1, \\
   \frac{1}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

2. Let $X$ and $Y$ be two independent random variables and $Z = X - Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } -1 \leq z < 0, \\
   \frac{1}{2} & \text{if } 0 \leq z \leq 1, \\
   0 & \text{otherwise}. 
   \end{cases} \]

3. Let $X$ and $Y$ be two independent random variables and $Z = X + Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } 0 \leq z < 1, \\
   \frac{1}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

4. Let $X$ and $Y$ be two independent random variables and $Z = X - Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } -1 \leq z < 0, \\
   \frac{1}{2} & \text{if } 0 \leq z \leq 1, \\
   0 & \text{otherwise}. 
   \end{cases} \]

5. Let $X$ and $Y$ be two independent random variables and $Z = X + Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } 0 \leq z < 1, \\
   \frac{1}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

6. Let $X$ and $Y$ be two independent random variables and $Z = X - Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } -1 \leq z < 0, \\
   \frac{1}{2} & \text{if } 0 \leq z \leq 1, \\
   0 & \text{otherwise}. 
   \end{cases} \]

7. Let $X$ and $Y$ be two independent random variables and $Z = X + Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } 0 \leq z < 1, \\
   \frac{1}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

8. Let $X$ and $Y$ be two independent random variables and $Z = X - Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } -1 \leq z < 0, \\
   \frac{1}{2} & \text{if } 0 \leq z \leq 1, \\
   0 & \text{otherwise}. 
   \end{cases} \]

9. Let $X$ and $Y$ be two independent random variables and $Z = X + Y$. Then $Z$ has density given by
   
   \[ f_Z(z) = \begin{cases} 
   \frac{1}{2} & \text{if } 0 \leq z < 1, \\
   \frac{1}{2} & \text{if } 1 \leq z \leq 2, \\
   0 & \text{otherwise}. 
   \end{cases} \]

10. Let $X$ and $Y$ be two independent random variables and $Z = X - Y$. Then $Z$ has density given by
    
    \[ f_Z(z) = \begin{cases} 
    \frac{1}{2} & \text{if } -1 \leq z < 0, \\
    \frac{1}{2} & \text{if } 0 \leq z \leq 1, \\
    0 & \text{otherwise}. 
    \end{cases} \]