

1	1	5	5	5
1	1	5	5	5
10	10	100	100	100
10	10	100	100	100
10	10	100	100	100

$$P(1) = \frac{4}{25} = 0.16$$

$$p(s) = \frac{6}{25} = 0.24$$

$$p(10) = \frac{6}{25} = 0.24$$

$$p(100) = \frac{9}{25} = 0.36$$

$$\begin{aligned} \text{Mean} &= \sum_{k=0}^{L-1} z_k p(z_k) = (0)p(0) + (1)p(1) + (2)p(2) + \dots + (255)p(255) \\ &= (1)(0.16) + (5)(0.24) + (10)(0.24) + (100)(0.36) \\ &= 39.76 \end{aligned}$$

$$\begin{aligned}\text{Variance} = \sigma^2 &= \sum_{k=0}^{L-1} (z_k - m)^2 p(z_k) = (0-m)^2 p(0) + (1-m)^2 p(1) + \dots + (255-m)^2 p(255) \\ &= (1-39.76)^2 (0.16) + (5-39.76)^2 (0.24) + (10-39.76)^2 (0.24) \\ &\quad + (100-39.76)^2 (0.36) \\ &= 2049.3\end{aligned}$$

standard deviation =  $\sigma$  = 45.2692