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Lab-5

1)

$$P(Y=0) = P(Y=0|X=0)P(X=0) + P(Y=0|X=1)P(X=1)$$

$$= 0.75 \times 0.5 + 0.35 \times 0.5$$

$$= 0.55$$

$$P(Y=1) = 1 - P(Y=0) = 0.455$$

$$2) \quad P(Y=y|X=x) = \frac{P(X=x, Y=y)}{P(X=x)} = \frac{P(Y=y|X=x)P(X=x)}{P(X=x)}$$

$$\Rightarrow P(Y=0|X=0) = \frac{0.75 \times 0.5}{0.5}$$

$$P(Y=1|X=0) = \frac{0.35 \times 0.5}{0.5}$$

$$P(Y=0|X=1) = \frac{0.35 \times 0.5}{0.5}$$

$$P(Y=1|X=1) = \frac{0.65 \times 0.5}{0.5}$$