

1.2 Probability Trees.

9. $A = \{(S,F), (F,F)\}$ ignore 3rd branch.

$$\begin{aligned}P(A) &= P(S,F) + P(F,F) \\&= 0.3 \times 0.4 + 0.7 \times 0.6 \\&= 0.12 + 0.42 \\&= 0.54 \quad \checkmark\end{aligned}$$

$$B = \{(SSS), (SSF), (SFS), (FSS)\}$$

$$\begin{aligned}P(B) &= P(SSS) + P(SSF) + P(SFS) + P(FSS) \\&= 0.3 \times 0.6 \times 0.8 + 0.3 \times 0.6 \times 0.2 + 0.3 \times 0.4 \times 0.7 + 0.7 \times 0.4 \times 0.6 \\&= 0.144 + 0.036 + 0.084 + 0.168 \\&= 0.432 \quad \checkmark\end{aligned}$$

$$C = \{(SSF), (F,SF)\}$$

$$\begin{aligned}P(C) &= P(SSF) + P(F,SF) \\&= 0.3 \times 0.6 \times 0.2 + 0.7 \times 0.4 \times 0.4 \\&= 0.036 + 0.112 \\&= 0.148 \quad \checkmark\end{aligned}$$

$$D = \{(FSS), (FFS)\}$$

$$\begin{aligned}P(D) &= P(FSS) + P(FFS) \\&= 0.7 \times 0.4 \times 0.6 + 0.7 \times 0.6 \times 0.3 \\&= 0.168 + 0.126 \\&= 0.294 \quad \checkmark\end{aligned}$$