$$P(\text{accepted at Harvard}) = P(H) = 0.3$$

$$P(\text{accepted at Dartmouth}) = P(D) = 0.5$$

$$P(H \cap D) = 0.2$$

The probability that she is accepted by Dartmouth if she is accepted by Harvard is:

$$\boldsymbol{P_H(D)} = \frac{P(H \cap D)}{P(H)} = \frac{\boldsymbol{0.2}}{\boldsymbol{0.3}} \approx \boldsymbol{0.667}$$

Is the event "accepted at Harvard" independent of the event "accepted at Dartmouth"?

The two events are stochastically independent if each of the following holds:

$$P(H \cap D) = P(H)P(D)$$

$$P_H(D) = P(D)$$

$$P(H) = P_D(H)$$

But:

$$P(H \cap D) = 0.2 \neq 0.15 = P(H)P(D)$$

$$P_H(D) = 0.667 \neq 0.5 = P(D)$$

$$P(H) = 0.3 \neq 0.4 = P_D(H)$$

Therefore, the two events are **not stochastically independent.**