

# Machine Learning Assignment 32

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## Problem 32-2A

**A:**

Well, you just have to find the chance that you will drawn an ace, then find the chance you WONT draw an ace four times. The order shouldn't really change the actual percentage, but the event happens 5 times. So the chance of the outcome happening is around 30%.

$$\begin{aligned}\text{Event} &= 5 \cdot \left( \frac{4}{52} \cdot \frac{48}{51} \cdot \frac{47}{50} \cdot \frac{46}{49} \cdot \frac{45}{48} \right) \\ &= 5 \cdot \left( \frac{3243}{54145} \right) \\ &= \frac{3243}{10829} \\ &\approx 0.29947\end{aligned}$$

**B:**

You can find the chance of this happening by finding the chance you draw NO aces and subtracting that by 1. So theres around a 34% chance that you will draw at least 1 ace.

$$\begin{aligned}\text{Event} &= 1 - \left( \frac{48}{52} \cdot \frac{47}{51} \cdot \frac{46}{50} \cdot \frac{45}{49} \cdot \frac{44}{48} \right) \\ &= 1 - \frac{35673}{54145} \\ &= \frac{18472}{54145} \\ &\approx 0.341158\end{aligned}$$

## Problem 32-2B

I'm assuming you just sorta go down the line? You end up with around a 91% chance

$$\begin{aligned}\text{Event} &= 1 - \left(\frac{6}{6} \cdot \frac{5}{6} \cdot \frac{4}{6} \cdot \frac{3}{6} \cdot \frac{2}{6}\right) \\ &= 1 - \frac{5}{54} \\ &= \frac{49}{54} \\ &= 0.907(407)\dots\end{aligned}$$