Eurisko Assignment 32-2

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(a) Five cards are dealt from a shuffled deck. What is the probability that the dealt hand contains

(I) exactly one ace?

$$P(x = 1) = \frac{4}{52} \cdot \frac{48}{51} \cdot \frac{47}{50} \cdot \frac{46}{49} \cdot \frac{45}{48} = 0.0598947271$$

(II) at least one ace?

$$
\begin{aligned}
P(x \geq 1) &= 1 - P(x = 0) \\
&= 1 - \left(\frac{48}{52} \cdot \frac{47}{51} \cdot \frac{46}{50} \cdot \frac{45}{49} \cdot \frac{44}{48} \right) \\
&= 1 - 0.658841998 \\
&= 0.341158002
\end{aligned}
$$

(b) You roll a die 5 times. What is the probability that at least one value is observes more than once?

$$
\begin{aligned}
P(x \geq 1) &= 1 - P(\text{no value duplicated}) \\
&= 1 - \left(\frac{5!}{6^5} \right) \\
&= 0.984567901
\end{aligned}
$$