Assignment 1
AI1110: Probability and Random Variables

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Problem:12.13.5.12: .
Find the probability of throwing at most 2 sixes in
6 throws of a single die.5^6,6^6

Solution:

Let X̲ be the random variable,which denotes
the N̲u̲m̲b̲e̲r̲ o̲f̲ s̲i̲x̲e̲s̲ in 6 throws of a single die.

$P_X(0)$ = Probability that 0 sixes are thrown after 6 throws = $5^6/6^6$= $\frac{15625}{46656}$

$P_X(1)$ = Probability that 1 sixes are thrown after 6 throws = $(C_1^6.5^5)/6^6$= $\frac{18750}{46656}$

$P_X(2)$ = Probability that 1 sixes are thrown after 6 throws = $(C_2^6.5^4)/6^6$= $\frac{9375}{46656}$

So,from the given equations;

$P_X(<=2)$ = Probability that at most 2 sixes are
thrown after 6 throws

= $P_X(0)+P_X(1)+P_X(2)$ = $\frac{21875}{23328}$

Hence,**The probability of throwing at most 2
sixes in 6 throws of a single die = $\frac{21875}{23328}$.**