

Suppose you flip  $n$  fair coins  $k$  times each. The question is, what's the probability that at least one of them will come up heads every single time? In order to compute this, define  $P_0$  as the probability that any given coin comes up heads every single time. This is just  $(1/2)^k$ . The probability that any given coin will have at least one tails outcome is  $1 - P_0$ . Therefore the probability that all of them have at least one tails outcome is  $(1 - P_0)^n$ , and the probability that at least one coin will be all heads is  $1 - (1 - P_0)^n$ .