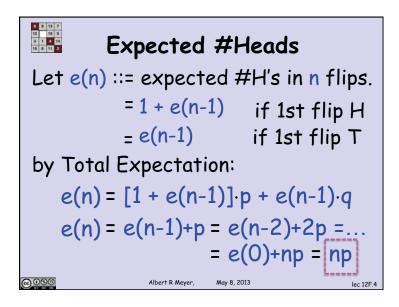


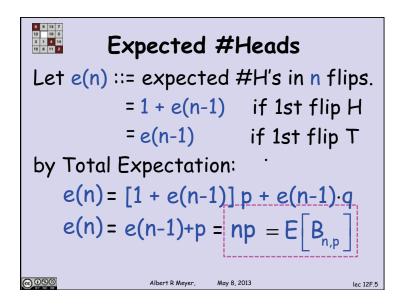
Law of Total Expectation
good for reasoning by cases
Def: conditional expectation

$$E[R | A] ::= \sum v \cdot pr[R = v | A]$$

 $E[R] = E[R | A] \cdot Pr[A]$
 $+ E[R | A] \cdot Pr[A]$

Law of Total Expectation More generally, many cases: $E[R] = E[R | A_1] \cdot Pr[A_1]$ $+ E[R | A_2] \cdot Pr[A_2] + \cdots$ $+ E[R | A_n] \cdot Pr[A_n] + \cdots$ when {A_i} partitions the sample space





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