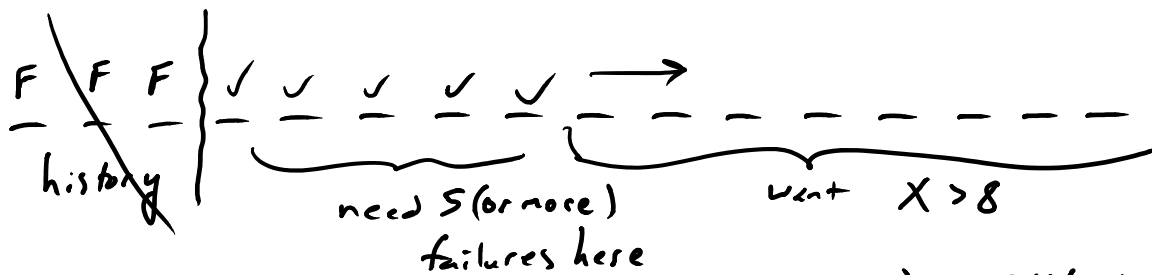


Memoryless property of geometric random variables.

Note: these are the only discrete random variable to have such a property. Say  $X$  is Geometric( $p$ ) random variable,

$$P(X > 8 \mid X > 3) = \frac{P(X > 8 \ \& \ X > 3)}{P(X > 3)} = \frac{P(X > 8)}{P(X > 3)} = \frac{q^8}{q^3} = q^5 = P(X > 5)$$



$$P(X > i+j \mid X > i) = \frac{P(X > i+j \ \& \ X > i)}{P(X > i)} = \frac{P(X > i+j)}{P(X > i)} = \frac{q^{i+j}}{q^i} = q^j = P(X > j)$$