

Quiz 16

written by Alvin Wan . alvinwan.com/cs70

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This quiz does not count towards your grade. It exists to simply gauge your understanding. Treat this as though it were a portion of your midterm or final exam. "Intuition Practice" might be tricky; watch out for subtleties. "Proofs" will be challenging to start; develop an arsenal of *approaches* to starting a problem.

1 Intuition Practice

For each of the following, circle "Always True" or "False". Then if false, construct two events X and Y that disprove the condition, given a uniform distribution across $\Omega = \{1, 2, 3, 4, 5, 6\}$.

1. (Always True or False) If $P[X] > P[Y]$, then $P[X|Z] > P[Y|Z]$.
2. (Always True or False) If X is independent of Y , $P[X] = \sum_z P[Z, X|Y]$.
3. (Always True or False) $P[X] > P[Y]$, then $P[XZ] > P[YZ]$.