HW 2

STAT 461 FALL 2026

SOA exam P problems 2, 8.

Problem 1. Replace the union of two events with symmetric difference in the inclusion-exclusion formula, and reformulate it.

Problem 2. Two events A and B with probabilities 60% and 80%. Find the maximal and the minimal possible values for $\mathbb{P}(A \cap B)$.

Problem 3. Give an example of a sample space with 3 events such that any two of them are not disjoint (they intersect), but the intersection of all three of them is an empty set.

Problem 4. Among the students in a certain college, 60% like to play video games in their free time, and 30% like to play board games. However, 5% like to do both. Find the percentage of students who like to play at least one type of games.

Problem 5. If $S = [0, 1]$ is the sample space with events $A = (0.5, 0.75)$ and $B = [0.6, 1]$, find the union, the intersection, the symmetric difference of these two events; the complement of A, and the complement of B, and the set difference $A \setminus B$.