

Instructions

1. Separate into groups of no more than three persons. Make sure that the members in your group are not the same as any earlier groups.
2. Only one submission is needed for each group. Late submission will not be accepted.
3. Write down only your first names and the last three digits of your student IDs in the provided table.
4. **Write down all the steps** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer. If you utilize formulas provided in lectures, state what the formulas are before you use them.
5. If you are the first group to correctly complete the third item above, you may submit your quiz right away and you will automatically get the full score for this quiz.
6. **Do not panic.**

Name	ID3
<i>Pra pun</i>	<i>555</i>

Kakashi and Gai are eternal rivals. Kakashi is a little stronger than Gai and hence for each time that they fight, the probability that Kakashi wins is 0.55. In a competition, they fight n times (where n is odd). We will assume that the results of the fights are independent. The one who wins more will win the competition.

Three Bernoulli trials

Suppose $n = 3$, what is the probability that Kakashi wins the competition. (Use your calculator to compute the final answer.)

Let N be the # wins that Kakashi has in these $n = 3$ fights.

We know that

$$P[N=k] = \binom{n}{k} p^k (1-p)^{n-k}$$

This is the same as the "majority rule" example in digital communication.

Kakashi will win the competition if he wins at least two out of three fights.

So, we can calculate the probability by

$$P[N=2] + P[N=3] = \binom{3}{2} 0.55^2 \times 0.45 + \binom{3}{3} 0.55^3$$

$$= 0.575$$

