Homework 1: Combinations

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April 7, 2019

Problem 1.
If $n \geq 2$, show that $\binom{n}{2}$ is even if and only if n has remainder 0 or 1 when divided by 4.

Problem 2.
Suppose you have m indistinguishable white balls and n indistinguishable black balls, and $m > n$. How many ways are there to arrange the balls so that no two black balls are next to each other? Your answer may have the form $\binom{u}{v}$ where u and v are some expressions of n and m.