Bilkent University
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Problem Of The Month

Term: January 2021

There are 2021 distinguishable boxes on the table. Starting Alice, Alice and Bob take turn writing an unordered box pair to the table (each unordered box pair can be written at most once). They stop when there are 4038 written pairs on the table. After that Bob numerates all box pairs by numbers $1, 2, \ldots, 4038$ and for each $k = 1, 2, \ldots, 4038$ puts k balls into each box belonging to the pair numbered k. Can Bob guarantee that any two boxes will contain different number of balls?