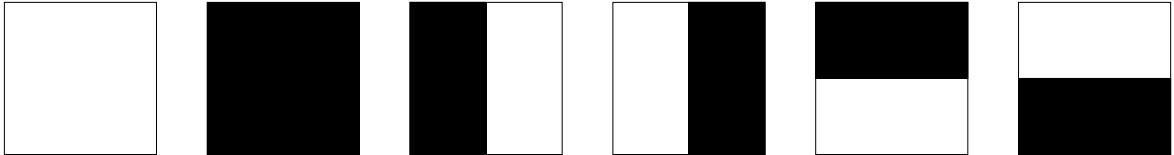


Team Number:

1. How many 4-digit numbers are divisible by 11, have a 5 in the hundreds place, and have a 7 in the ones place? (517 is not a 4-digit number.)

Team Number:

2. A league of nations decides that commerce can be streamlined if all nations standardize the design of their flags. Under the new rules, all flags must be squares, consisting of two equally thick stripes (which can be both vertical or both horizontal), and each stripe must be one of ten standardized colors. Both stripes are allowed to be the same color, so for example there are six flags using the colors black and white:



How many distinct flags can be created?

Team Number:

3. A **Harshad number** is a number that's divisible by the sum of its digits. Some examples of Harshad numbers are 10 (divisible by $1 + 0$) and 27 (divisible by $2 + 7$). 2025 is Harshad, as were 2024, 2023, and 2022. What is the next Harshad year?

Team Number:

4. Find the last four digits of 2025^{2025} .

Team Number:

5. A **Matryoshka square** is a square number from which another positive square number can be obtained by deleting one digit. Two examples of Matryoshka squares are 16 (deleting the 6 leaves 1^2) and 2025 (deleting the 0 leaves 15^2).

2025 is an **order two Matryoshka square** because 225 is also a Matryoshka square.

There are 18 Matryoshka squares less than 2025, including four of order two and three of order 3. Score n points by finding an order n Matryoshka square other than 16, 225, or 2025.