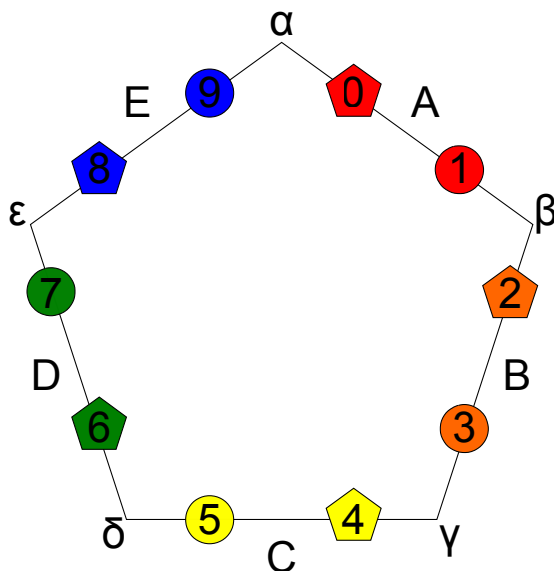


Unsquare Dance

Square dancing is just so...square.

It's time to learn pentagon dancing! Pentagon dancing is for five couples, arranged along the sides of a pentagon. The sides of the pentagon are labelled A, B, C, D, and E in clockwise order, and the vertices of the pentagon are labelled α , β , γ , δ , and ϵ in clockwise order, with where α is the vertex between sides A and E, β is the vertex between B and A, and so on. Typically, the dancers occupy ten spots numbered from 0 to 9, in clockwise order, with 0 and 1 on side A, and so on. In the starting position, the couples are designated by the colors red, orange, yellow, green, and blue. The dancers that start in even-numbered spots are designated by small pentagons, and the dancers that start in odd-numbered spots are designated by small circles, as shown below:



Naturally, the dancers will move around over the course of the dance, but the sides, vertices, and spots do not move. At any time, a dancer's **partner** is the other dancer in their side, and a dancer's **corner** is the other dancer adjacent to their nearest vertex. At any time, the **odds** are the dancers in the odd-numbered spots, and the **evens** are the dancers in the even-numbered spots.

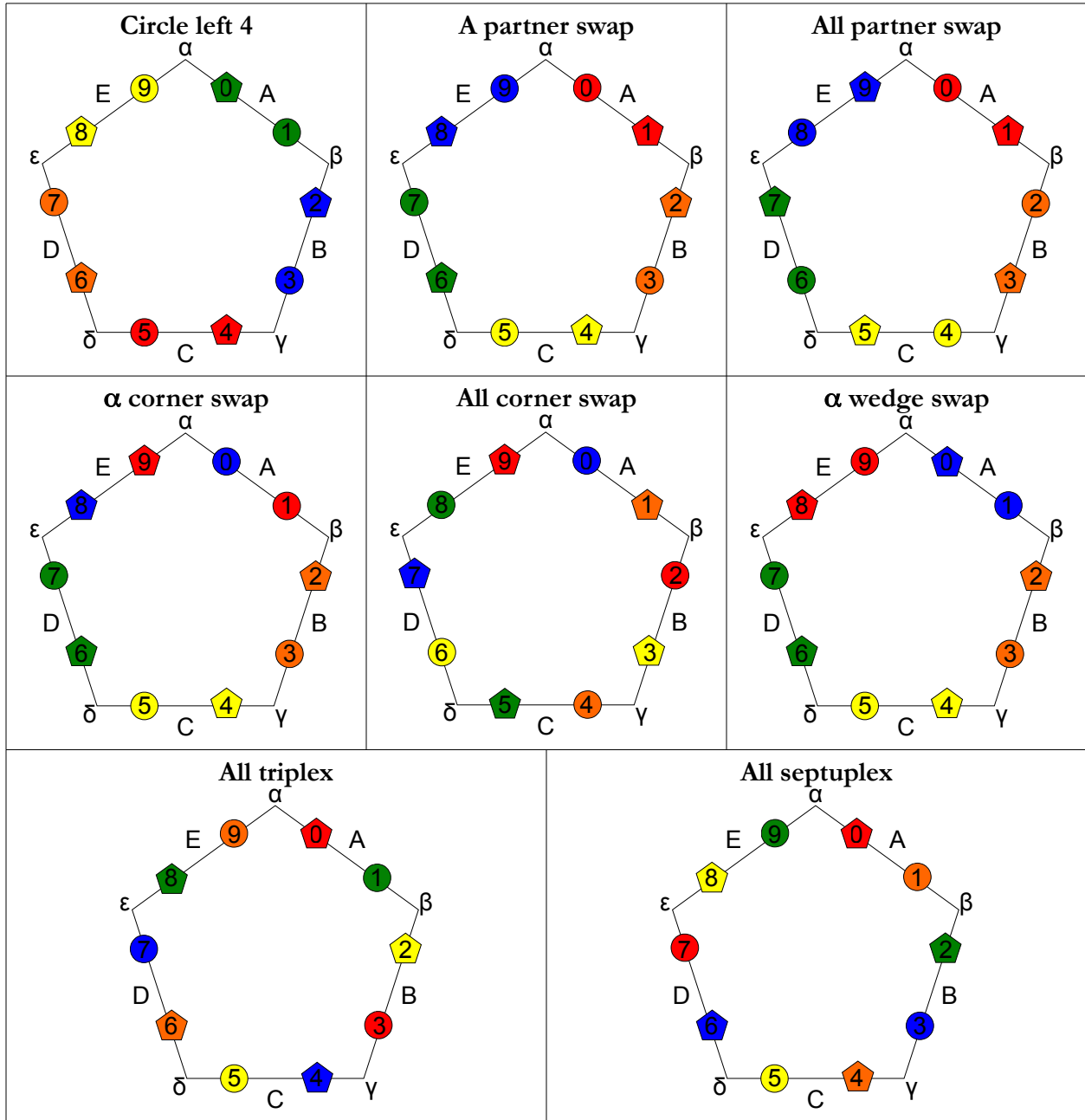
Over the course of a dance, the dancers will be moving around the pentagon in response to instructions from an unseen caller. For this dance, you will need to learn the following moves:

- **Circle left n .** Each dancer moves to their left (clockwise) n spots, where n is an integer.
- **Partner swap.** The two partners on a side swap places. The caller may specify one or more particular sides to partner swap, ("B partner swap," "C and E partner swap") or they may specify "All partner swap," in which case every dancer swaps places with their partner.
- **Corner swap.** The two corners adjacent to a vertex swap places. Similarly, this may apply to specific vertices, (" α corner swap," " β and δ corner swap") or to all dancers ("all corner swap").
- **Wedge swap.** Given a specified vertex, perform a corner swap at that vertex, followed by partner swaps at the two sides adjacent to that vertex, and then another corner swap at that vertex, so that the sides adjacent to the vertex swap en masse. The caller may specify one vertex, or two vertices that do not share a side (" γ wedge swap," " α and δ wedge swap").

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- **Triplex.** Each dancer takes the number of their current slot, triples it, takes the last digit of the result, and moves to that slot. Since a triplex makes evens go to evens and odds go to odds, the caller may specify "evens triplex," "odds triplex," or "all triplex."
- **Septuplex.** Each dancer takes the number of their current slot, multiplies it by seven, takes the last digit of the result, and moves to that slot. Similarly, the caller may specify "evens septuplex," "odds septuplex," or "all septuplex."

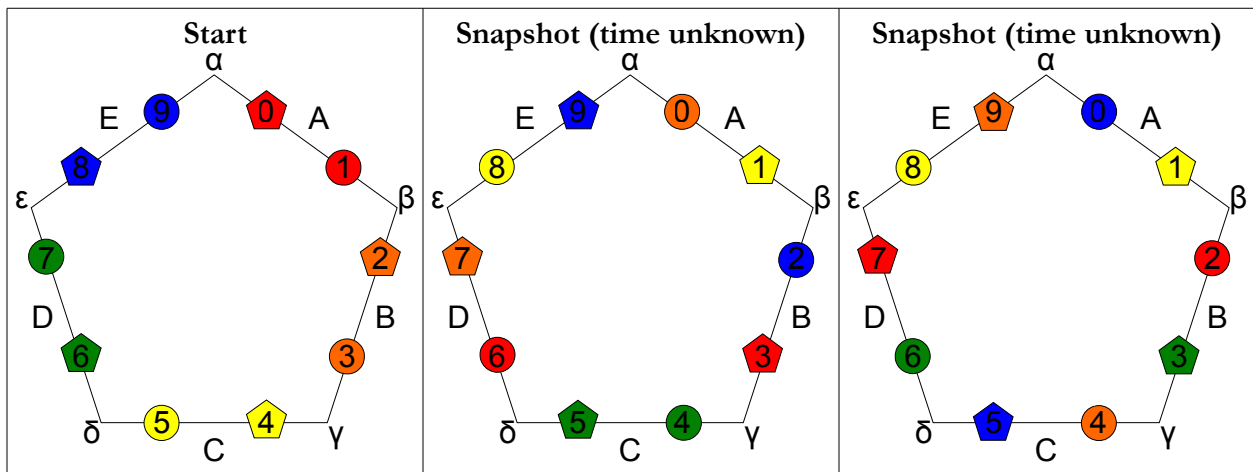
As a guide, the following illustrations show the results of various pentagon dance calls, **each one** starting from the **basic** arrangement shown on the first page:



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Now it's time to dance. Ten dancers, named Karen, April, Simone, Martha, Pranav, Violet, Miles, Esteban, Ignacio, and Karim, start out in spots 0 to 9 in that order. They then perform each of the following instructions. Unfortunately, we have forgotten what order the instructions were given in, but we do have snapshots of the arrangement at a couple of points (not necessarily in order), as indicated in some of the instructions. Also, the dancers will occasionally be writing things on the ground, but we didn't get snapshots of that. Reconstruct the sequence of instructions, and use the letters on the ground to figure out how to get a ten-letter answer from the sides of the pentagon.

- α wedge swap. All corner swap. Take a snapshot.
- β and ϵ wedge swap. All partner swap. On each side, the partners together should take the vowel that comes last alphabetically in either of their names and write it on the ground.
- Circle left 3. Take a snapshot.
- ϵ corner swap. E partner swap. ϵ corner swap.
- Evens septuplex. Odds triplex. On each side, the partner whose name comes earlier alphabetically should write the 103rd letter of their name (wrapping around from the last letter to the first) on the ground.
- γ and ϵ wedge swap. All triplex. On each side, each of the evens should write the n th letter of their corner's name on the ground, where n is the alphanumeric value (A=1, B=2, etc.) of the side that their partner started on.



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