

Size 1

{ } 1 even sized subset

{1} 1 odd sized subset

Size 2

{ }, {1,2} 2 even sized subsets

{1}, {2} 2 odd sized subsets

Size 3

{1}, {2}, {3}, {1,2,3} 4 odd sized subsets

{ }, {1,2}, {1,3}, {2,3} 4 even sized subsets

Size 4

{1,4}, {2,4}, {3,4}, {1,2,3,4}, { }, {1,2}, {1,3}, {2,3} 8 even

{4}, {1,2,4}, {1,3,4}, {2,3,4}, {1}, {2}, {3}, {1,2,3} 8 odd



Choose 6 slots out of 9 for going Right (to get to (6, 3)).

Let's split up our counting:

1) Group 1 - all paths that start going U

2) Group 2 - all paths that start going R

Group 1, we went up, so we need to go up 2 more times and go right 6 times, which we can do in $\binom{8}{2}$ ways.

Group 2, we went right, so we need to go right 5 more times and go up 3 times which we can do in $\binom{8}{3}$ ways.

Since I split up our paths into 2 disjoint groups and all paths must start either Up or Right, the answer to the question is just the sum of these two: $\binom{8}{2} + \binom{8}{3}$.

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A E B C D F I G O U H

11 total slots

5 vowels

Need to choose 5 slots out of 11 for the vowels Can do this in $11 C 5$ ways.

Key observation: **THE VOWELS ARE FORCED IN PLACE!!!**

Question: Are the consonants now forced also? YES!!!

Answer: 11 C 5...