

Cosine Similarity:

it's a metric used to measure the similarity (correlation) of two vectors.

Exercise Name	chest	core	Legs and glutes	Sternal Pectoralis Major	Rectus Abdominis	Quadriceps	Anterior Deltoid	Clavicular (Upper) Pectoralis Major	Triceps Brachii	Obliques	Gluteus Maximus	Dynamic stabilizer
Push-up	0.25	0	0	1	0	0	0.50	0.50	0.50	0	0	0.50
Knee-Push-up	0.25	0	0	1	0	0	0.50	0.50	0.50	0	0	0
Crunch	0	0.25	0	0	1	0	0	0	0	0.50	0	0
Jump squat	0	0	0.25	0	0	1	0	0	0	0	0.50	0.50

$$similarity(A, B) = \frac{A \cdot B}{\|A\| \times \|B\|}$$

if A = “push-up” and B = “Knee-push-up”, then the $similarity(A, B)$ will be calculated as following:

$$A \cdot B = (0.25 \cdot 0.25) + (1 \cdot 1) + (0.5 + 0.5) + (0.5 \cdot 0.5) + (0.5 + 0.5) + (0.5 \cdot 0) = 1.81$$

$$\|A\| = \sqrt{0.25^2 + 1^2 + 0.5^2 + 0.5^2 + 0.5^2 + 0.5^2} = 1.436$$

$$\|B\| = \sqrt{0.25^2 + 1^2 + 0.5^2 + 0.5^2 + 0.5^2 + 0^2} = 1.346$$

$$similarity(A, B) = \frac{1.81}{1.436 \times 1.346} = 0.936$$

Exercise name	Push-up	Knee-Push-up	crunch	Jump squat
Push-up	1			
Knee-Push-up	0.936	1		
Crunch	0	0	1	
Jump squat	0.139	0	0	1