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## Siamese Networks

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Reading: Computing the Cost II

Week 3 Computing the Cost II

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# Computing the Cost II

Now that you have the matrix with cosine similarity scores, which is the product of two matrices, we go ahead and compute the cost.

$$\cos(v_1, v_2)$$

		$v_1$				
			_1	_2	_3	_4
$v_2$	_1	0.9	-0.8	-0.3	-0.5	
	_2	-0.8	0.5	-0.1	-0.2	
	_3	-0.3	-0.1	0.7	-0.8	
	_4	-0.5	-0.2	-0.8	1.0	

mean\_neg: speeds up training

closest\_neg: helps penalize the cost more

We now introduce two concepts, the **mean\_neg**, which is the mean negative of all the other off diagonals in the row, and the **closest\_neg**, which corresponds to the highest number in the off diagonals.

$$\text{Cost} = \max(-\cos(A, P) + \cos(A, N) + \alpha, 0)$$

So we will have two costs now:

$$\text{Cost1} = \max(-\cos(A, P) + \text{mean\_neg} + \alpha, 0)$$

$$\text{Cost2} = \max(-\cos(A, P) + \text{closest\_neg} + \alpha, 0)$$

The full cost is defined as: Cost 1 + Cost 2.

