import tensorflow.compat.v1 as tf

def get\_pairwise\_scores(tensor\_input):

"""

This is so far used in pariwise learning-to-rank

Arguments:

tensor\_input: a dense `Tensor` of shape [n\_data, 1]

n\_data is the number of teet candidates

Returns:

pairwise scores: a dense `Tensor` of shape [n\_data, n\_data].

"""

return tensor\_input - tf.transpose(tensor\_input)

def get\_pairwise\_label\_scores(labels):

"""

This is so far used in pariwise learning-to-rank

Args:

labels: a dense `Tensor` of shape [n\_data, 1]

n\_data is the number of teet candidates

Returns:

pairwise label scores: a dense `Tensor` of shape [n\_data, n\_data].

each value is within [0, 1]

"""

# raw pairwise label scores/differences

pairwise\_label\_scores = get\_pairwise\_scores(labels)

# sanity check to make sure values in differences\_ij are [-1, 1]

differences\_ij = tf.maximum(tf.minimum(1.0, pairwise\_label\_scores), -1.0)

# values in pairwise\_label\_scores are within [0, 1] for cross entropy

return (1.0 / 2.0) \* (1.0 + differences\_ij)