tf.keras.backend.batch_dot

```
batch_dot(
    x,
    y,
    axes=None
)
```

Defined in `tensorflow/python/keras/_impl/keras/backend.py`.

Batchwise dot product.

`batch_dot` is used to compute dot product of `x` and `y` when `x` and `y` are data in batch, i.e. in a shape of `(batch_size, :)`. `batch_dot` results in a tensor or variable with less dimensions than the input. If the number of dimensions is reduced to 1, we use `expand_dims` to make sure that ndim is at least 2.

Arguments:

- `x`: Keras tensor or variable with `ndim >= 2`.
- `y`: Keras tensor or variable with `ndim >= 2`.
- `axes`: list of (or single) int with target dimensions. The lengths of `axes[0]` and `axes[1]` should be the same.

Returns:

```
A tensor with shape equal to the concatenation of `x`'s shape
(less the dimension that was summed over) and `y`'s shape
(less the batch dimension and the dimension that was summed over).
If the final rank is 1, we reshape it to `(batch_size, 1)`.
```

Examples: Assume `x = [[1, 2], [3, 4]]` and `y = [[5, 6], [7, 8]]` `batch_dot(x, y, axes=1) = [[17, 53]]` which is the main diagonal of `x.dot(y.T)`, although we never have to calculate the off-diagonal elements.

```
Shape inference:
Let `x`'s shape be `(100, 20)` and `y`'s shape be `(100, 30, 20)`.
If `axes` is (1, 2), to find the output shape of resultant tensor,
    loop through each dimension in `x`'s shape and `y`'s shape:

* `x.shape[0]` : 100 : append to output shape
* `x.shape[1]` : 20 : do not append to output shape,
    dimension 1 of `x` has been summed over. (`dot_axes[0]` = 1)
* `y.shape[0]` : 100 : do not append to output shape,
    always ignore first dimension of `y`
* `y.shape[1]` : 30 : append to output shape
* `y.shape[2]` : 20 : do not append to output shape,
    dimension 2 of `y` has been summed over. (`dot_axes[1]` = 2)
`output_shape` = `(100, 30)`
```

```
>>> x_batch = K.ones(shape=(32, 20, 1))
>>> y_batch = K.ones(shape=(32, 30, 20))
>>> xy_batch_dot = K.batch_dot(x_batch, y_batch, axes=[1, 2])
>>> K.int_shape(xy_batch_dot)
(32, 1, 30)
```

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