

## tf.contrib.metrics.streaming\_sparse\_precision\_at\_top\_k

```
streaming_sparse_precision_at_top_k(
    top_k_predictions,
    labels,
    class_id=None,
    weights=None,
    metrics_collections=None,
    updates_collections=None,
    name=None
)
```

Defined in [tensorflow/contrib/metrics/python/ops/metric\\_ops.py](#).

See the guide: [Metrics \(contrib\) > Metric Ops](#)

Computes precision@k of top-k predictions with respect to sparse labels.

If **class\_id** is not specified, we calculate precision as the ratio of true positives (i.e., correct predictions, items in **top\_k\_predictions** that are found in the corresponding row in **labels**) to positives (all **top\_k\_predictions**). If **class\_id** is specified, we calculate precision by considering only the rows in the batch for which **class\_id** is in the top **k** highest **predictions**, and computing the fraction of them for which **class\_id** is in the corresponding row in **labels**.

We expect precision to decrease as **k** increases.

**streaming\_sparse\_precision\_at\_top\_k** creates two local variables, **true\_positive\_at\_k** and **false\_positive\_at\_k**, that are used to compute the precision@k frequency. This frequency is ultimately returned as **precision\_at\_k**: an idempotent operation that simply divides **true\_positive\_at\_k** by total (**true\_positive\_at\_k** + **false\_positive\_at\_k**).

For estimation of the metric over a stream of data, the function creates an **update\_op** operation that updates these variables and returns the **precision\_at\_k**. Internally, set operations applied to **top\_k\_predictions** and **labels** calculate the true positives and false positives weighted by **weights**. Then **update\_op** increments **true\_positive\_at\_k** and **false\_positive\_at\_k** using these values.

If **weights** is **None**, weights default to 1. Use weights of 0 to mask values.

#### Args:

- top\_k\_predictions**: Integer **Tensor** with shape [D1, ... DN, k] where N >= 1. Commonly, N=1 and top\_k\_predictions has shape [batch size, k]. The final dimension contains the indices of top-k labels. [D1, ... DN] must match **labels**.
- labels**: **int64 Tensor** or **SparseTensor** with shape [D1, ... DN, num\_labels], where N >= 1 and num\_labels is the number of target classes for the associated prediction. Commonly, N=1 and **labels** has shape [batch\_size, num\_labels]. [D1, ... DN] must match **top\_k\_predictions**. Values should be in range [0, num\_classes), where num\_classes is the last dimension of **predictions**. Values outside this range are ignored.
- class\_id**: Integer class ID for which we want binary metrics. This should be in range [0, num\_classes), where num\_classes is the last dimension of **predictions**. If **class\_id** is outside this range, the method returns NAN.
- weights**: **Tensor** whose rank is either 0, or n-1, where n is the rank of **labels**. If the latter, it must be broadcastable to **labels** (i.e., all dimensions must be either 1, or the same as the corresponding **labels** dimension).
- metrics\_collections**: An optional list of collections that values should be added to.
- updates\_collections**: An optional list of collections that updates should be added to.

- `name` : Name of new update operation, and namespace for other dependent ops.

## Returns:

- `precision` : Scalar `float64 Tensor` with the value of `true_positives` divided by the sum of `true_positives` and `false_positives` .
- `update_op` : `Operation` that increments `true_positives` and `false_positives` variables appropriately, and whose value matches `precision` .

## Raises:

- `ValueError` : If `weights` is not `None` and its shape doesn't match `predictions` , or if either `metrics_collections` or `updates_collections` are not a list or tuple.
- `ValueError` : If `top_k_predictions` has rank < 2.

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