tf.contrib.bayesflow.entropy.elbo_ratio

```
elbo_ratio(
    log_p,
    q,
    z=None,
    n=None,
    seed=None,
    form=None,
    name='elbo_ratio'
)
```

Defined in **tensorflow/contrib/bayesflow/python/ops/entropy_impl.py** .

See the guide: BayesFlow Entropy (contrib) > Ops

Estimate of the ratio appearing in the `ELBO` and `KL` divergence.

With `p(z) := exp{log_p(z)}`, this `Op` returns an approximation of

```
E_q[ Log[p(Z) / q(Z)] ]
```

The term `E_q[ Log[p(Z)] ]` is always computed as a sample mean. The term `E_q[ Log[q(z)] ]` can be computed with samples, or an exact formula if `q.entropy()` is defined. This is controlled with the kwarg `form` .

This log-ratio appears in different contexts:

KL[q || p]

If `log_p(z) = Log[p(z)]` for distribution `p` , this `Op` approximates the negative Kullback-Leibler divergence.

```
elbo_ratio(log_p, q, n=100) = -1 * KL[q || p],
KL[q || p] = E[ Log[q(Z)] - Log[p(Z)] ]
```

Note that if `p` is a `Distribution` , then `distributions.kl_divergence(q, p)` may be defined and available as an exact result.

ELBO

If `log_p(z) = Log[p(z, x)]` is the log joint of a distribution `p` , this is the Evidence Lower BOund (ELBO):

```
ELBO ~= E[ Log[p(Z, x)] - Log[q(Z)] ]
      = Log[p(x)] - KL[q || p]
      <= Log[p(x)]
```

User supplies either `Tensor` of samples `z` , or number of samples to draw `n`

Args:

- `log_p` : Callable mapping samples from `q` to `Tensors` with shape broadcastable to `q.batch_shape` . For example, `log_p` works "just like" `q.log_prob` .

- `q` : `tf.contrib.distributions.Distribution` .

- `z` : `Tensor` of samples from `q` , produced by `q.sample(n)` for some `n` .

- `n` : Integer `Tensor` . Number of samples to generate if `z` is not provided.

- `seed` : Python integer to seed the random number generator.

- `form` : Either `ELBOForms.analytic_entropy` (use formula for entropy of `q`) or `ELBOForms.sample` (sample estimate of entropy), or `ELBOForms.default` (attempt analytic entropy, fallback on sample). Default value is `ELBOForms.default` .

- `name` : A name to give this `Op` .

Returns:

Scalar `Tensor` holding sample mean KL divergence. `shape` is the batch shape of `q` , and `dtype` is the same as `q` .

Raises:

- `ValueError` : If `form` is not handled by this function.

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