

tf.contrib.distributions.normal_conjugates_known_scale_predictive

```
normal_conjugates_known_scale_predictive(
    prior,
    scale,
    s,
    n
)
```

Defined in [tensorflow/contrib/distributions/python/ops/normal_conjugate_posteriors.py](#).

See the guide: [Statistical Distributions \(contrib\) > Normal likelihood with conjugate prior](#)

Posterior predictive Normal distribution w. conjugate prior on the mean.

This model assumes that `n` observations (with sum `s`) come from a Normal with unknown mean `loc` (described by the Normal `prior`) and known variance `scale**2`. The "known scale predictive" is the distribution of new observations, conditioned on the existing observations and our prior.

Accepts a prior Normal distribution object, having parameters `loc0` and `scale0`, as well as known `scale` values of the predictive distribution(s) (also assumed Normal), and statistical estimates `s` (the sum(s) of the observations) and `n` (the number(s) of observations).

Calculates the Normal distribution(s) $p(x \mid \sigma^2)$:

```
p(x | sigma**2) = int N(x | mu, sigma**2)N(mu | prior.loc, prior.scale**2) dmu
                = N(x | prior.loc, 1 / (sigma**2 + prior.scale**2))
```

Returns the predictive posterior distribution object, with parameters `(loc', scale'**2)`, where:

```
sigma_n**2 = 1/(1/sigma0**2 + n/sigma**2),
mu' = (mu0/sigma0**2 + s/sigma**2) * sigma_n**2.
sigma'**2 = sigma_n**2 + sigma**2,
```

Distribution parameters from `prior`, as well as `scale`, `s`, and `n`. will broadcast in the case of multidimensional sets of parameters.

Args:

- `prior`: `Normal` object of type `dtype`: the prior distribution having parameters `(loc0, scale0)`.
- `scale`: tensor of type `dtype`, taking values `scale > 0`. The known stddev parameter(s).
- `s`: Tensor of type `dtype`. The sum(s) of observations.
- `n`: Tensor of type `int`. The number(s) of observations.

Returns:

A new Normal predictive distribution object.

Raises:

- `TypeError` : if dtype of `s` does not match `dtype` , or `prior` is not a Normal object.

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