**Co-clustering**

We assume that the latent random variable , which indicates the latent membership of location i, is given by:

Similarly, we assume that the latent variable , which indicates the latent membership of species j if the location was assigned to group q, is given by:

Based on these two latent variables, we assume that:

Priors:

#------------------------------

FCDs

* For

*For existing groups*

Taking logs, this becomes:

*For new groups*

Assuming that each species belongs to a separate group

Because this is the kernel of a beta distribution, we can solve this integral in closed form:

Taking logs, this becomes:

We draw this variable from a multinomial distribution.

* For

*For existing groups*

Taking logs, this becomes:

*For new groups*

Taking logs, this becomes:

We draw this variable from a multinomial distribution.

* For

where and

* For

Where and

* For
* For

Taking log, this becomes:

* For

Taking log, this becomes: