**Applying Copulas to Discrete Data**

Consider two sets of risk factor data and We can compute the empirical correlation in the usual way, but now we want to use a copula to create a two-dimensional distribution which has as marginals the distribution of X and the distribution of Y. This new distribution of X and Y can now be analyzed using Monte Carlo, unlike the original empirical data.

Consider a Gaussian copula. First reorder the X’s and Y’s so that

Now let

Now let

Then let

Under this distribution, we note that