// Multivariate Regression Example

// Taken from stan-reference-2.8.0.pdf p.66

data {

int<lower=0> N; // num individuals

int<lower=1> K; // num ind predictors

int<lower=1> J; // num groups

int<lower=1> L; // num group predictors

int<lower=1,upper=J> jj[N]; // group for individual

matrix[N,K] x; // individual predictors

row\_vector[L] u[J]; // group predictors

vector[N] y; // outcomes

}

parameters {

corr\_matrix[K] Omega; // prior correlation

vector<lower=0>[K] tau; // prior scale

matrix[L,K] gamma; // group coeffs

vector[K] beta[J]; // indiv coeffs by group

real<lower=0> sigma; // prediction error scale

}

model {

tau ~ cauchy(0,2.5);

Omega ~ lkj\_corr(2);

to\_vector(gamma) ~ normal(0, 5);

{

row\_vector[K] u\_gamma[J];

for (j in 1:J)

u\_gamma[j] <- u[j] \* gamma;

beta ~ multi\_normal(u\_gamma, quad\_form\_diag(Omega, tau));

}

{

vector[N] x\_beta\_jj;

for (n in 1:N)

x\_beta\_jj[n] <- x[n] \* beta[jj[n]];

y ~ normal(x\_beta\_jj, sigma);

}

}

# Note: Octothorpes indicate comments, too!