**##hw4 sarah ward**

library (deSolve)

lotka.volterra <- function(t, y, p) {

N1 <- y[1]

N2 <- y[2]

with(as.list(p), {

dN1.dt <- (r1 \* N1 / K1)\*(K1 - N1 - a12 \* N2)

dN2.dt <- (r2 \* N2 / K2)\*(K2 - N2 - a21 \* N1)

return(list(c(dN1.dt, dN2.dt)))

})

}

**## set your variables, time, initial conditions (can vary, this time theyre the same)**

t <- 1:20

y0 <- c ('N1' = 0.1, 'N2' = 0.1)

p <- c('r1' = 0.1, 'r2' = 0.6,

'K1' = 2, 'K2' = 1,

'a12' = 0.15, 'a21' = 0.3)

?ode

sim <- ode(y = y0, times = t, func = lotka.volterra, parms = p, method = 'lsoda')

exp1 <- as.data.frame (sim)

plot (N1 ~ time, type = 'l', col = 'blue', bty = 'l', data = exp1, ylim = c(0, 2), xlab = 'Time', ylab = 'Population')

points (N2 ~ time, type = 'l', lty = 2, col = 'red', data = exp1)

legend (15, 2, c('N1', 'N2'), lty = c(1, 2), col = c('blue', 'red'), bty = 'n')

**##change t to 100**

t <- 1:100

sim <- ode(y = y0, times = t, func = lotka.volterra, parms = p, method = 'lsoda')

exp2 <- as.data.frame (sim)

plot (N1 ~ time, type = 'l', col = 'blue', bty = 'l', data = exp2, ylim = c(0, 2), xlab = 'Time', ylab = 'Population')

points (N2 ~ time, type = 'l', lty = 2, col = 'red', data = exp2)

legend (80, 1.5, c('N1', 'N2'), lty = c(1, 2), col = c('blue', 'red'), bty = 'n')

**##the write up is with the handwritten part of my homework**

**##I would like to work on the Eurasian collared dove topic**

