

Running the GJSTL model

July 30, 2012

We have separated the R code into 6 files for the various stages of model implementation.

1. GJSTL_1stData.R – this reads in the data (from .inp format), then develops the appropriate capture and tag histories as well as other variables required for the model. **Change the name of the data file to be read in here.**
2. GJSTL_2ndFunction.R – this is a file of all the R functions used later in the code. This includes the likelihood function.
3. GJSTL_3rdDM.R – this file creates the design matrices for the various models.
4. GJSTL_4thTest.R – this is where the model is specified. This is also where the negative loglikelihood is minimized. **Change the model to be estimated here.**
 - Model 1 = parameters vary across groups (except b^* that vary only over time)
 - Model 2 = parameters vary across groups and sample times (except b^* that vary only over time)
 - Model 3 = parameters do not vary across groups or sample times (except b^* that vary only over time)
 - Model 7 = Parameters do not vary across groups but do vary across sample times.
 - Model 8 = capture varies across group and time, survival varies across group, tag retention varies across group and time, b^* varies over time.
5. GJSTL_5thSE.R – standard errors are estimated using the delta method
6. GJSTL_6thGOF.R – the goodness of fit test is run. Here both the saturated model likelihood as well as the conditional likelihood are calculated.

Data

We have provided a test data set in the file: **Data.txt**

This data was generated as model 1 using the following parameters

Ng=1000 – superpopulation size of each group

Fraction double tagged = 20%

phi_g= 0.8,0.6

p_g=0.45, 0.75

lambda_g = 0.6, 0.8

b^* = 0.5, 0.6, 1

Running the code in R

All of the above files must be run in the order given. Note that this code was written with 2 groups in mind. If more than 2 groups are used, you are on your own and may have to modify the code. We tried to generalize the code but have not thoroughly tested it for more than 2 groups.

Running the JSTL model (only 1 group)

There is a flag in the GJSTL_1stData.R file that must be set to 0 to run the JSTL model. This variable is called GJSTL and is located at the top of the file.

Errors in the Code

The number of degrees of freedom is calculated incorrectly as the number of beta parameters includes the last entry probability b^*k which is equal to 1.

- Fixed 31/1/2013- must set bflag=1 if bstar varies by group and 0 otherwise (in GJSTL_4thTest.R)

Please report other errors that you find to: lcowen@uvic.ca