Assignment 7

Complete the following three exercises using Excel and the spreadsheet Exercise\_7. Email the completed spreadsheet to [Steury@auburn.edu](mailto:Steury@auburn.edu), be sure to answer 2c in your email.

1. On the sheet labeled Binomial Likelihood, use the solver to confirm that the MLE of p for n = 50 and y = 10 is .2 as illustrated in the table and graph provided.
   1. Enter the formula for the log - likelihood in cell C2.
   2. Enter an initial value for p in C3. (0.5 is usually a good start)
   3. Start the solver (Its under Data).
   4. Add the constraints that C3 < 1 and C3 > 0 .
   5. Solve to maximize the value in C2 by changing C3.
2. On the sheet labeled Binomial w Link, use the solver to estimate the βs using the logit link for each of the models: Null (intercept only), Distance (linear model with intercept and distance effect), Distance\_2 (polynomial model with parameters intercept, distance and distance2)
   1. In the column labeled "logit" enter the linear models. When doing so, make sure you construct the formula with reference to the cells in the parameters table associated with each model. For example the first cell in the logit for the Distance model should be =$K$4+C10\*$K$5.
   2. Use the solver to find the MLE by maximizing the sum of the ln(L(y|n,p)) for each respective model by changing the parameter values (βs) for each respective model. For example maximize the value of M60 by changing values in K4:K5 for the Distance model.
   3. Compare the results for the models in the graph and the AICc table and report your conclusions in your email with the completed spreadsheet. Which is the best approximating model? Which model would be selected? Why would you expect this result based on the graphs of the top 2 models?
3. Following the examples above, on the sheet labeled Multinomial, use the solver to estimate the values of p1-p3 under the model that each of them differ (unconstrained). Paste your estimates in cells F3-F6. Then constrain them to be equal by entering the formula =C2 in cells C3 and C4 and using the solver to change only the value in C2. Paste your estimates in cells I3-I6.