D2L Rubrics
A tutorial
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OU
The Statistics LAB
# maximum likelihood for univariate likelihoods

# various log likelihoods defined
logbin=function(x,param) 
log(dbinom(x,prob=param,size=10))
logpoiss=function(x,param) log(dpois(x,lambda=param))
logexp=function(x,param) log(dexp(x,rate=param))

#max likelihood function
### For repeated sampling from same distribution
mymaxlik=function(lfun,x,param,...){
  # how many param values are there?
np=length(param)
  # outer -- notice the order, x then param
  # this produces a matrix -- try
  outer(1:4,5:10,function(x,y) paste(x,y,sep=" "))
  to understand
  z=outer(x,param,lfun)
  # z is a matrix where each x,param is replaced with the
  function evaluated at those values
  y=apply(z,2,sum)

• Task 2
  – Create your own R file and record the R code you
    used to complete the lab.
  – In the above code for mymaxlik() there are two
    lines marked A and B. Using any resources
    available explain what each line does
      • Line A (Use the command in the comments
to explain what outer() does)
      • Line B
  – Suppose that a series of 8 binomial experiments
    were performed, with each having 20 trials and
    each with the same probability of success \( p \). Find
    the maximum likelihood estimate for \( p \) by first
    answering the following
      • What is the formula (mathematical – no R
        code) for the likelihood?
      • What is the R code for the above
        likelihood?
      • Find the maximum likelihood estimate
        when the following is the data \( y = 3,3,4,3,4,5,5,4 \) (record the plot).
Why Rubrics?

Need to check that procedural skills in Statistics labs have been acquired.
Need to grade quickly since there are labs each week along with other grading.
Need to be consistent.
Need to give informative feedback with personal commentary as well.
Need to manage grades simultaneously.
Rubrics

• Could be seen as canned and overly formulaic.
  – Not a problem for what I am testing
  – Can be used after the fact
  – Can be configured to assess original thinking using many levels and appropriate point distributions (time consuming to make)

• I have used a number of rubric styles but use mainly a binary – present/absent grading method for the labs
D2L—Edit Course
Rubrics
New Rubric

Rubrics available to this org unit are listed below. The Status column indicates the status of each rubric and affects how it can be used. What is a rubric status?

Search For: Show Search Options

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Scoring Method</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ass1</td>
<td>Marks for Ass1</td>
<td>Analytic Custom Points</td>
<td>Draft</td>
<td></td>
</tr>
</tbody>
</table>
Fill out the properties
Name – say TSI-Lab10
Levels – 2 in my case

Criteria – Number of questions
Levels and Criteria tab
Edit Rubric - TSILab10

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task1 Qu1</td>
<td>Add Criteria Group</td>
<td>0 points</td>
<td>Edit Criteria Group</td>
</tr>
<tr>
<td>Criterion 2</td>
<td>Add Criteria Group Above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criterion 3</td>
<td>Add Criteria Group Below</td>
<td></td>
<td>Add Criterion</td>
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<tr>
<td>Criterion 4</td>
<td>Delete Criteria Group</td>
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<tr>
<td>Criterion 5</td>
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<td>Criterion 6</td>
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<tr>
<td>Criterion 7</td>
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</table>
**Edit Criteria Group - TSILab10**

**Criteria Group Name**

Tasks

**Level Names**

<table>
<thead>
<tr>
<th>Level Name</th>
<th>Score (points)</th>
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<tbody>
<tr>
<td>Correct</td>
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</tr>
<tr>
<td>Incorrect</td>
<td>0</td>
</tr>
</tbody>
</table>

**Criteria Names**

<table>
<thead>
<tr>
<th>Criterion Name</th>
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</thead>
<tbody>
<tr>
<td>Task1 Qu1</td>
</tr>
<tr>
<td>Criterion 2</td>
</tr>
<tr>
<td>Tasks</td>
</tr>
<tr>
<td>---------------</td>
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<tr>
<td>Task 1 Qu 1</td>
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<tr>
<td>Criterion 2</td>
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<td>Criterion 3</td>
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<td>Criterion 4</td>
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<td>Criterion 8</td>
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<td>Criterion 9</td>
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<tr>
<td>Criterion 10</td>
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<tr>
<td><strong>Overall Score</strong></td>
</tr>
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</table>

In the next tab, further adjustments for criteria and levels can be made.
Edit level
Fill in description and Feedback

**Description and Feedback**

Descriptions for each criterion that uses this performance level should outline the requirements to meet this level. Feedback for each criterion is optional.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
<th>Feedback</th>
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</thead>
<tbody>
<tr>
<td>Task1 Qu1</td>
<td>Basic Advanced</td>
<td>Find the max lik estimate of the poisson likelihood with data y = 5, 1, 2, 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Well done! Looks like you understand the poisson and its use in R when making likelihoods.</td>
</tr>
</tbody>
</table>

Criterion 2
Fill in Incorrect Column
Give some feedback that will point the student in the right direction.
When satisfied make status “Published”
Once made and saved go to dropbox
Make a new dropbox
Pick a category from grade book
Pick a grade Item
Now select the Rubric you made
None

Out Of
10

Student View Preview
10 / 10

Rubrics
Add Rubric
TSILab10
[Create Rubric in New Window]

Default Scoring Rubric
No default selected

Custom Instructions
Adjust restrictions on dropbox
Associations will appear with your gradebook
Leave Feedback

<< Back to User Submissions

By: [Name] Submitted: Oct 20, 2014 9:46 AM

MATH 4753 Laboratory 10: Maximum likelihood estimates

In this lab we will learn how to use R to make maximum likelihood estimates from a sample. A number of functions will be used and should be well understood. While you are not expected to make your own functions I will expect you to understand the lines of code and be capable of adjusting the function to do what is required.

Evaluation

Rubrics

Lab 10
Score: 32 / 32 points - 100.00 %
Level achieved: Level 2

Score

32 / 32

Grade Item: Laboratory Dropbox 10

Update Retract
Grading is a sinch!
Publish/Update and your done! RAR man!!