Study Guide for Regression Methods Final Exam April 28, 2020

The Final Exam is scheduled for:

|  |  |  |  |
| --- | --- | --- | --- |
| **Index** | **Section** | **Exabym Code** | **Exam Day and Time** |
| 29880 | 01 | S | Tuesday, May 12, 2020: 8:00 PM - 11:00 PM |

I will place the Exam in Canvas as an Assignment for release at 7:45 pm and assign the deadline to submit answers by at 11:00 pm.

Answers can be submitted as .txt, .docx, .pdf files or as pictures taken with your mobile phone in any combination. One way to return the test is to take a picture of each page of your answer sheet and upload the pictures into Canvas. If you have difficulty uploading your answers into Canvas then send by e-mail from your mobile phone to my Rutgers e-mail: [mardekia@stat.rutgers.edu](mailto:mardekia@stat.rutgers.edu). Sending separate e-mails for each page of the answer sheet is OK.

The following statement from the Rutgers Honors Pledge is in effect for the Final Exam:*“On my honor, I have neither received nor given any* ***unauthorized*** *assistance on this examination.”*

* The test is **open book, open notes, open online resources. You are to work alone.**
* No R coding questions will be asked on this Exam.
* There will be ~10 questions.
* No calculations are needed.
* One or two questions will be based on the Midterm Exam – Review Midterm Exam Answer Sheet.
* Use the sample questions provided for the Midterm Exam and the questions on the Midterm Exam as a guide to the questions to be asked on the Final Exam. Additional guidance regarding sample questions will be provided during HW Review tonight.
* Topics covered during the lectures will be emphasized.
* **Material in text to review for Final Exam**
  + **Use the lecture material as a guide to material in textbook to review. The Chapter.Section numbering is based on the 8th edition.**
  + **Residual Analysis (8.1 – 8.5 were also included in Midterm Exam)**
  + **8.1 Introduction**
  + **8.2 Regression Residuals**
  + **8.3 Detecting Lack of Fit**
  + **8.4 Detecting Unequal Variances**
  + **8.5 Checking the Normality Assumption**
  + **8.6 Detecting Outliers and Identifying Influential Observations**
  + **8.7 Detecting Residual Correlation: The Durbin-Watson Test**
  + **CASE STUDY 4 An Analysis of Rain Levels in California**
  + **Special Topics in Regression**
  + **9.4 Weighted Least Squares**
  + **9.6 Logistic Regression**
  + **9.7 Poisson Regression**
  + **9.8 Ridge and LASSO Regression**
  + **Introduction to Time Series Modeling and Forecasting**
  + **10.1 What is a Time Series**
  + **10.2 Time Series Components**
  + **10.3 Forecasting Using Smoothing Techniques**
  + **10.4 Forecasting: The Regression Approach**
  + **10.5 Autocorrelation and Autoregressive Error Models**
  + **10.7 Constructing Time Series Models**
  + **10.8 Fitting Time Series Models with Autoregressive Errors**
  + **10.9 Forecasting with Time Series Autoregressive Models**
* **Lecture Documents:** See the Module “Lectures After Spring Break”.

|  |  |
| --- | --- |
|  | **Material in 2nd column can be ignored** |
| **Lecture9\_Outline.pptx** | |
| leverage\_influence\_graph.pdf |  |
| Diagnostics.pdf |  |
|  | euclid\_and\_H\_distance.sas |
| euclid\_and\_H\_distance.pdf |  |
|  | Diag\_SAS\_QUASAR.sas |
| Diag\_SAS\_QUASAR\_output.xlsx |  |
| Diag\_SAS\_QUASAR\_output\_show.pdf |  |
| Measures of Influence.pdf |  |
| Math 50 Fall 2017, Homework #7.pdf |  |
| Cook\_distance.pdf |  |
| **Lecture10\_Outline.pptx** | |
|  | Diag\_more\_QUASAR.R |
| Diag\_more\_QUASAR\_R\_out.txt |  |
| Diag\_more\_QUASAR\_R\_out.pdf |  |
|  | QUASAR\_e\_i.R |
| QUASAR\_e\_i\_out.txt |  |
| QUASAR\_e\_i\_out.pdf |  |
| Weighted Least Squares.pdf |  |
| WLSexample\_show.pdf |  |
| Loess\_Chapter.pdf |  |
|  | loess\_intro2.R |
| loess\_intro2\_1.pdf |  |
| loess\_intro2\_2.pdf |  |
| **Lecture11\_Outline.pptx** | |
|  | loess\_intro3.R |
| loess\_intro3\_Out.txt |  |
| loess\_intro3\_CV.pdf |  |
| loess\_intro3\_Figure\_show.pdf |  |
| coefpartialdeter.pdf |  |
| LogisticRegression.pdf |  |
| AIC\_LogLikelihoodinR.pdf |  |
| Pages from LogisticRegression.pdf |  |
| Logistic Regression with Maximum Likelihood Estimation.pdf |  |
|  | MLE\_example.R |
| MLE\_example\_Out.pdf |  |
|  | Logistic\_as\_a\_Classifier.R |
| Logistic\_as\_a\_Classifier\_R\_Out.txt |  |
| Logistic\_as\_a\_ClassifierR\_Figure.pdf |  |
|  | lowbirth.R |
| lowbirthR\_Out.txt |  |
| LikelihoodRatioTest.pdf |  |
| Remission\_Example.R | Remission\_Example.R |
| Remission\_Example\_out.txt |  |
| Remission\_ExampleR\_Figure.pdf |  |
|  | Neuralgia\_Example.R |
| Neuralgia\_ExampleR\_Out.txt |  |
| **Lecture12\_Outline.pptx** | |
|  | Linear regression by gradient descent \_ R-bloggers.pdf |
| Evaluate\_Logistic\_Model.pdf |  |
| R squared in logistic regression – The Stats Geek.pdf |  |
| RPubs - Logistic regression using R.pdf |  |
| What are pseudo R-squareds\_.pdf |  |
|  | Remission\_R2.R |
| Remission\_R2\_Out.pdf |  |
| PoissonRandomVariable.pptx |  |
|  | Poisson\_regression\_example.R |
| Poisson\_regression\_example\_Out.txt |  |
| Poisson\_HeartValveFailures\_Figure.pdf |  |
| Poisson\_regression\_example\_sas.pdf |  |
| MSE\_Estimator.pdf |  |
|  | collin\_seatpos.R |
| collin\_seatpos\_Out.pdf |  |
| collin\_seatpos\_Figure.pdf |  |
| Ridge\_LASSO\_Regression.pptx |  |
| RidgeRegression.pdf |  |
|  | ridge\_fatinmeat.R |
| ridge\_fatinmeat\_Out.txt |  |
| ridge\_fatinmeatR\_Figure.pdf |  |
|  | Ridgeexample.sas |
| Ridgeexample.pdf |  |
|  | ridgevslasso.sas |
| ridgevslasso.pdf |  |
|  | Ridge\_LASSO\_fatinmeat.R |
| Ridge\_LASSO\_fatinmeat\_Out.txt |  |
| Ridge\_LASSO\_fatinmeat\_Figure.pdf |  |
|  | Ridge\_Lasso\_prostate.R |
| Ridge\_Lasso\_prostate\_Out.txt |  |
| Ridge\_Lasso\_prostate\_Figure.pdf |  |
|  | lasso\_prostate1.R |
| lasso\_prostate1\_Out.txt |  |
| lasso\_prostate1\_Figure.pdf |  |
|  | Lasso\_prostate\_binary.R |
| Lasso\_prostate\_binary\_Out.txt |  |
| Lasso\_prostate\_binary\_Figure.pdf |  |
| **Lecture13\_Outline.pptx** | |
| Intro\_to\_Time\_Series\_Modeling\_and\_Forecasting  Chapter 10.pptx |  |
|  | Exercise10\_6.R |
| Exercise10\_6R\_Out.txt |  |
| Exercise10\_6\_Figure.pdf |  |
| Ex10\_6\_Answer.pdf |  |
|  | Ex10\_11.sas |
| Ex10\_11\_Output.pdf |  |
|  | Exercise10\_16.R |
|  | Ex10\_26.sas |
| Ex10\_26\_Output.pdf |  |
|  | Ex10\_31.sas |
| Ex10\_31\_Output.pdf |  |
|  | Ex10\_35.sas |
| Ex10\_35\_Output.pdf |  |

* **HW Answers:** HW06 through HW14 will be placed in a Module “HW06-HW14 Answers” immediately right below the Lectures Module. Be sure to understand the answers to the questions asked in the HW problems.