Machine Learning Project Guidelines

- **General Description**

  For the project, choose a topic (and data) of your interest, preferably from your major field, for which you should use the concepts from Machine Learning course to model the problem and analyze the results. The project requires you to synthesize all the material from the course. Hence, it is one of the best ways to solidify your understanding of Machine Learning. Your project will be presented through an oral presentation.

- **Due Date**

  1. Date for Project Presentation: July. 15th (within 10 minutes)
  2. Presentation file & Code: You have to turn in your presentation file and code (with dataset) before your presentation via email.

- **Project Grading Guidelines**

  Your project will be graded based on the following (using the accompanying rubric):

  1. Project Presentation: title, abstract, introduction, analysis, results, discussion & conclusion, future work, references.
  2. Some suggestions for scoring high on these criteria, and suggestions you should keep in mind whenever you write anything:
     (a) Be selective with computer output (figures) to help clarity.
     (b) You should make audiences undertand your data clearly. Describe and explain your data before you move to your model.
     (c) If you are using techniques we learned in class, you do not have to re-explain the techniques.
     (d) If you are using techniques that we did not cover in class, you should definitely explain the techniques.
     (e) Use the equation editor in Microsoft PowerPoint, Word, or LaTeX to typeset math symbols, expressions, and equations. Do not use images for symbols, expressions, and equations.
  3. Listening to the other students' presentation

     Not only the quality of your presentation, but your attidude as a audiance of the other presentations is also important. I would like you to show your respect to all presentors. All of you are supposed to ask a couple of questions or provide comments for the other students' presentations.

- **Guidelines for Making an Impressive Complete Presentation**

  An impressive presentation communicates your project in a clear and concise fashion. The presentation should address the following points:

  - Title: As short as possible (one sentence and not more than two lines) for your project
  - Abstract: Describe the questions you address, any key issues surrounding the questions, and what you have done in the project.
  - Introduction: Describe the context of your problem with an explanation of the dataset, motivation, and importance.
  - Analyses: Describe the model or analysis used in your project, including basic concepts and theory. Be ready to explain why you believe these methods are justified.
    - Choose some of the models you want to use:
      Multiple Regression, KNN, Logistic Regression, LDA, QDA
    - Based on the model's objectives, compare a couple of models' performances and discuss the results.
    - Present your final model and the provide appropriate explaination for your choice.
  - Results: Present your results. Include tables and/or graphs that support your analyses. Do not simply copy the results of the R/Python. Use the useful information only. Rewrie the numerical results for the professional presentation.
  - Discussion & Conclusions: Discuss your results with Interpretation of the model based on the contexst. Conclude your findings, importance of the model, and its limitations.
  - Future Work: What could be done to improve your project if someone wants to continue or extend it in the future?
  - References: Relevant references.
  - You do not have to show your R (Python or Matlab) code in presentation or report.