Regression & Classification

Lab 4

Regression Models

Models to predict numerical quantities (usually continuous)

Examples Applications:

- Predict **price** of a stock.
- Estimate **age** of a person.

Example Models:

- Linear Regression (y = a*x + b)
- Polynomial Regression (y = a0 + a1*x + a2*x^2 + ...)
- Logistic Regression (probability prediction)

Classification Models

Models to classify something into predefined categories (usually discrete)

Example Applications:

- Determine **manufacturer** of a laptop.
- Determine a **digit** (0,...,9) based on hand-written image.

Example Models:

- Naive Bayes
- SVM
- KNN
- Decision Trees

Lab 4 data

MNIST: An image dataset containing handwritten digits.

- Each image comes with a class label of 0-9.
- We will use the vectorization of an image as feature of that image.
- The division of training and testing sets are given in advance.

Lab 4 goals

- Train/test classification models based on MINIST data.
- Learn basic data visualization and analyze skills.
- Learn how to use scikit machine learning libraries.
- Learn the characteristics of different classification models.

Lab 4 details

iPython Notebook: https://github.com/dihong/TA/blob/master/lab4.ipynb

Task: DIY #1, #2, and #3

Guidance: follow the instructions in lab4.ipynb file.

Submission:

- Upload one .pdf file for each question, lab 4 answer sheet.
- Include both **scripts** and **outputs**.

Some common questions

- Confusion matrix

C	Predicted Class			
Actual Class				

- iPython Notebook not loading properly

Q & A

Quiz: 10 min

Passcode: ds111