AI course Project 1

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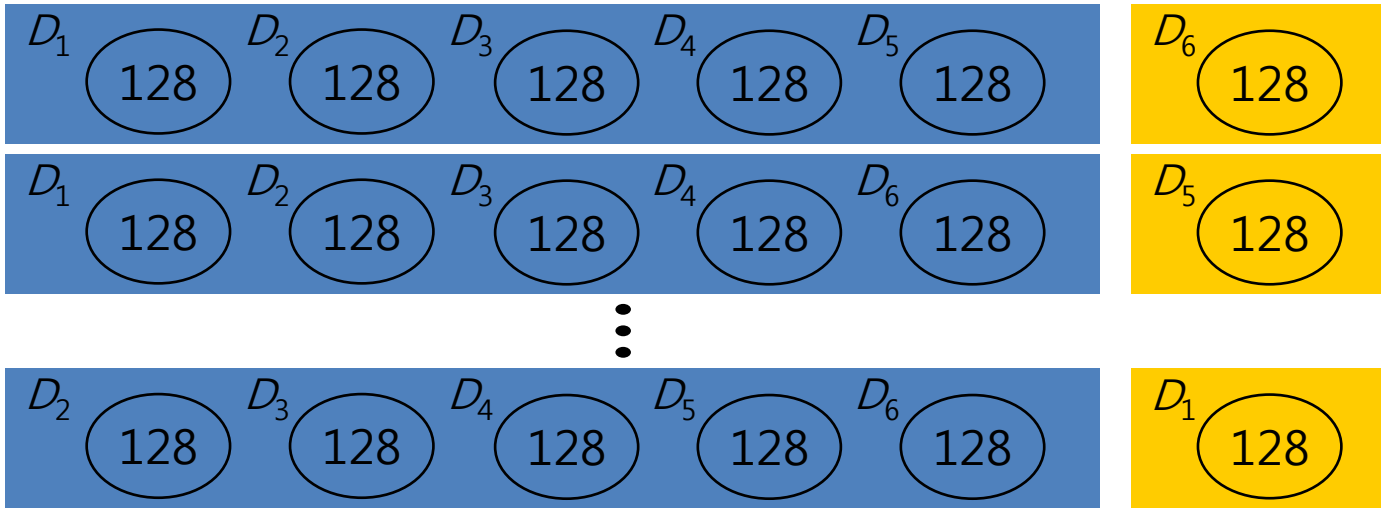
BI
BIOINTELLIGENCE

Evaluation Method - Cross Validation

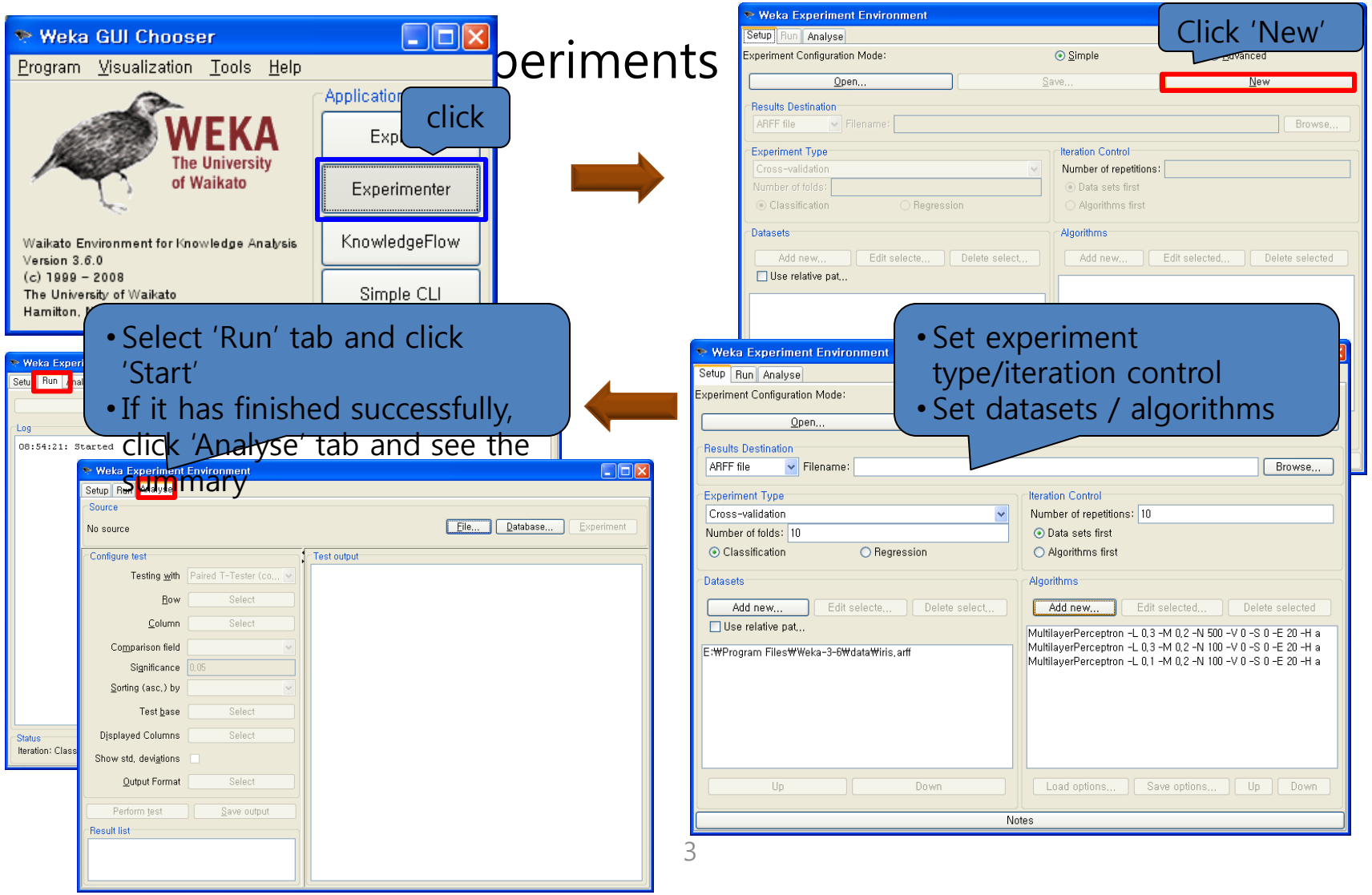
- *K*-fold Cross Validation
  - The data set is randomly divided into *k* subsets.
  - One of the *k* subsets is used as the 'test set' and the other *k*-1 subsets are put together to form a 'training set'.

$$Error = \frac{1}{k}\sum_{i=1}^{k} Error_i$$

6-fold cross validation



Using Experimenter in Weka



Project 1

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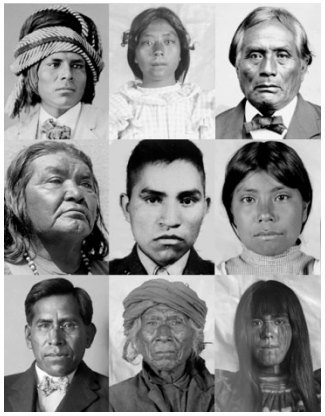
- Classification problem with Weka
  - Data set
    - 3 different data sets
    - MNIST, Prima Indians Diabetes+1
  - Classification methods
    - MLP: iters, learning rate, momentum, # of hidden nodes, cross-validation

- Contents in the report
  - You should
    - compare the results of various parameter settings for MLPs
    - find optimal parameter setting for MLP and report the classification performance on that setting on all data sets
    - Include discussions
  - At most A4 four pages
  - Due date: 7th May 2012, pm 11:59 (via email)

Dataset #1: Pima Indians Diabetes

- Description
  - Pima Indians have the highest prevalence of **diabetes** in the world
  - We will build **classification models** that diagnose if the patient shows signs of diabetes
  - http://archive.ics.uci.edu/ml/datasets/Pima+Indians+Diabetes

- Configuration of the data set
  - 768 instances
  - 8 attributes
    - age, number of times pregnant, results of medical tests/analysis
    - all numeric (integer or real-valued)
    - Also, a discretized set will be provided
  - Class value = 1 (Positive example)
    - Interpreted as "tested positive for diabetes"
    - 500 instances
  - Class value = 0 (Negative example)
    - 268 instances



Dataset #2: Handwritten Digits (MNIST)

- Description
  - The MNIST database of handwritten digits contains digits written by office workers and students
  - We will build a recognition model based on classifiers with the reduced set of MNIST
  - http://yann.lecun.com/exdb/mnist/

- Configuration of the data set
  - Attributes
    - pixel values in gray level in a 28x28 image
    - 784 attributes (all 0~255 integer)
  - Full MNIST set
    - Training set: 60,000 examples
    - Test set: 10,000 examples
  - For our practice, a reduced set with 800 examples is used
  - Class value: 0~9, which represent digits from 0 to 9