**CSE 5693 Machine Learning HW4**
**Due Apr 7, 2014, 6:30pm**
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1. Written assignment (pdf):
   (a) 9.4
   (b) 10.1
   (c) 10.3
   (d) 10.6
   (e) From testIrisSelection in the programming assignment, compare the three selection strategies. Plot test set accuracy against number of generations and discuss your observations.
   (f) From testIrisReplacement in the programming assignment, plot test set accuracy against replcaement rate ($r$) and discuss/explain your observations.

2. Programming assignment: Genetic Algorithm
   (a) allow variable-length individuals, each individual is a rule set similar to Section 9.3.
   (b) Input parameters include:
      - population size ($p$)
      - replacement rate ($r$)
      - mutation rate ($m$)
      - stopping criterion (e.g. fitness threshold, number of generations)
      - selection strategy (fitness-proportional, tournament, rank)
   (c) Test your implementation on:
      i. Tennis dataset (same as HW2 and 3)
      ii. Iris dataset (same as HW2 and 3)
   (d) For each of the following experiments, provide a script/program/function (using parameter values you found are appropriate) for running the test:
      i. testTennis: output the learned rules (in human-readable form similar to HW2), and accuracy on training and test sets.
      ii. testIris: output the learned rules (in human-readable form similar to HW2), and accuracy on training and test sets.
      iii. testIrisSelection: vary generation number, output generation number and test set accuracy for each of the three selection strategies
      iv. testIrisReplacement: vary replacement rate $r$ [.1 to .9, .1 increment], output replacement rate and test set accuracy
   (e) The same program should be able to handle the different data sets.
   (f) Use C (GNU gcc), C++ (GNU g++), Java (Oracle Java), LISP (CLISP), or Python. If you don't have a preference, use Java since it's more portable.
   (g) Your program preferrably runs on code.fit.edu (linux).
   (h) Submission:
      i. README.txt: how to compile and run the tests (preferrably on code.fit.edu)
      ii. source code