Optimization Methods for Machine Learning - Fall 2017

Assignments

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- **The code**: we expect 2 (two) executable files (.py is the Python file extension) for each question of each homework and an output txt file for each homework (so if homework 1 has 3 questions, we expect 6 executable files and 1 only output txt file), named in the following way:

  1. Main_homework1_question1_teamNumber.py
  2. Functions_homework1_question1_teamNumber.py
  3. Main_homework1_question2_teamNumber.py
  4. Functions_homework1_question2_teamNumber.py
  5. Main_homework1_question3_teamNumber.py
  6. Functions_homework1_question3_teamNumber.py
  7. output_homework1_teamNumber.txt

- **Example of the Functions file**

  - def generateTrainingTestSets():
    ...
    return X_train,Y_train,X_test,Y_test

  - def trainMLP(X_train,Y_train,numNeurons,w0,b0,v0):
    ...
    return wopt,bopt,vopt,numFunctionEvaluations,numGradientsEvaluations,totalComputingTime

  - def computeMLPOutput(w,b,v,x):
    ...
    return the output of the MLP given the input sample x

- def computeMLPFunctionToMinimize(w,b,v,X,Y):
  ...
  return the mean squared error over the samples in X and Y

- def evaluateFrankeFunction(x):
  ...
  return y

- ...
- ...

- **Example of the Main file**
  - Given w0,b0,v0
  - x_train,y_train,x_test,y_test = generateTrainingTestSets()
  - optimized_parameters,numFunctionEvaluations,numGradientsEvaluations,totalComputingTime = trainMLP(x_train,y_train,numNeurons,w0,b0,v0)
  - predictions = computeMLPOutput(...)
  - testMSE = computeMeanSquaredError(...)
  - print outputs to file (see example files)