Dating classification with KNN algorithm. Euclidean distance $d\left(p,q
ight) = \sqrt{\sum_{i=1}^{n}\left(q_{i}-p_{i}
ight)^{2}}$ Classification from numpy import * import operator def classify0(inX, dataSet, labels, k): dataSetSize = dataSet.shape[0] diffMat = tile(inX, (dataSetSize, 1)) - dataSet sqDiffMat = diffMat ** 2 sqDistances = sqDiffMat.sum(axis=1) distances = sqDistances ** 0.5 sortedDistIndicies = distances.argsort() classCount = {} for i in range(k): voteIlabel = labels[sortedDistIndicies[i]] classCount[voteIlabel] = classCount.get(voteIlabel, 0) + 1 sortedClassCount = sorted(classCount.items(), key=operator.itemgetter(1), reverse=True return sortedClassCount[0][0] Read into matrix In [9]: def file2matrix(filename): fr = open(filename) numberOfLines = len(fr.readlines()) # get the number of lines in the file returnMat = zeros((numberOfLines, 3)) # prepare matrix to return classLabelVector = [] # prepare labels return fr = open(filename) ### New heading index = 0for line in fr.readlines(): line = line.strip() listFromLine = line.split("\t") returnMat[index, :] = listFromLine[0:3] classLabelVector.append(int(listFromLine[-1])) index += 1 return returnMat, classLabelVector **Norming** def autoNorm(dataSet): minVals = dataSet.min(0) maxVals = dataSet.max(0)ranges = maxVals - minVals normDataSet = zeros(shape(dataSet)) m = dataSet.shape[0] normDataSet = dataSet - tile(minVals, (m, 1)) normDataSet = normDataSet / tile(ranges, (m, 1)) # element wise divide return normDataSet, ranges, minVals **Dating test** def datingClassTest(): hoRatio = 0.50 # hold out 50% datingDataMat, datingLabels = file2matrix("datingTestSet2.txt" # load data setfrom file normMat, ranges, minVals = autoNorm(datingDataMat) m = normMat.shape[0] numTestVecs = int(m * hoRatio) errorCount = 0.0for i in range(numTestVecs) classifierResult = classify0(normMat[i, :], normMat[numTestVecs:m, :], datingLabels[numTestVecs:m], 3 print("the classifier came back with: %d, the real answer is: %d" % (classifierResult, datingLabels[i], if classifierResult != datingLabels[i]: errorCount += 1.0 print("the total error rate is: %f" % (errorCount / float(numTestVecs))) print(errorCount) datingClassTest() the classifier came back with: 3, the real answer is: 3 the classifier came back with: 2, the real answer is: 2 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: the classifier came back with: 1, the real answer is: the classifier came back with: 1, the real answer is: the classifier came back with: 3, the real answer is: 3 the classifier came back with: 3, the real answer is: 3 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 3, the real answer is: 3 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 2, the real answer is: 2 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: 1 the classifier 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1 the classifier came back with: 3, the real answer is: the classifier came back with: 3, the real answer is: 3 the classifier came back with: 3, the real answer is: 3 the classifier came back with: 3, the real answer is: 3 the classifier came back with: 2, the real answer is: 2 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: 1the classifier came back with: 1, the real answer is: 1the classifier came back with: 1, the real answer is: the classifier came back with: 3, the real answer is: 3 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 2, the real answer is: 1 the classifier came back with: 2, the real answer is: 2 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 1, the real answer is: 1 the classifier came back with: 2, the real answer is: 2 the total error rate is: 0.066000 33.0 **Plotting** import matplotlib.pyplot as plt fig = plt.figure() plt.style.use(["dark_background"]) # dark background plt.rcParams["figure.figsize"] = [30, 20] # set the size of the plot plt.rcParams["figure.dpi"] = 100 # dpi, doesn't really matter, but the higher the slower to render it ax = fig.add_subplot(111) datingDataMat, datingLabels = file2matrix("datingTestSet2.txt" ax.scatter(datingDataMat[:, 1], datingDataMat[:, 2], 15.0 * array(datingLabels), 15.0 * array(datingLabels), ax.axis([-2, 25, -0.2, 2.0])

plt.xlabel("Percentage of Time Spent Playing Video Games")

plt.ylabel("Liters of Ice Cream Consumed Per Week")

plt.show()