Record for 1.27-1.31

目标：

1. 完成EM的代码。对比不同输入拆分完的结果。

方法1：使用python中的sklearn里面自带的GaussianMixture 就可以实现

方法2：自己写了一个，不过只限于1维的Gaussian Mixture Model

结果：最后得到的结果与k（设定的Gaussian数量）有关，并且根据输入的不同，最后得到的Gaussian会不同。同时运算时间偏长。

用np.random.normal生成不同的Gaussian Distributions. 再用concatenate去把不同的Gaussian组合在一起。

例子：

（迭代了200次）

S1：miu=20，sigma=0.1

S2：miu=23，sigma=1

S3=0.5S1+0.5S2

EM（S3，2）：

[ 1.84607982e-09 9.99999998e-01] [ 20.14157095 21.503318 ] [ 406.04955368 423.15302465]

[ 1.88003146e-09 9.99999998e-01] [ 21.49394023 21.503318 ] [ 4.58798307 2.76697562]

[ 1.81290963e-09 9.99999998e-01] [ 21.71029634 21.503318 ] [ 3.33521408 2.76697561]

[ 1.81114231e-09 9.99999998e-01] [ 21.7692056 21.503318 ] [ 3.09343063 2.76697561]

[ 1.81393875e-09 9.99999998e-01] [ 21.80484019 21.503318 ] [ 3.04540569 2.76697561]

[ 1.81755966e-09 9.99999998e-01] [ 21.83648674 21.503318 ] [ 3.0444585 2.76697561]

[ 1.82178601e-09 9.99999998e-01] [ 21.86811095 21.503318 ] [ 3.05555848 2.76697561]

[ 1.82664237e-09 9.99999998e-01] [ 21.90054675 21.503318 ] [ 3.06913803 2.76697561]

[ 1.83216764e-09 9.99999998e-01] [ 21.93386442 21.503318 ] [ 3.08232159 2.76697561]

[ 1.83839687e-09 9.99999998e-01] [ 21.96793847 21.503318 ] [ 3.09410703 2.76697561]

[ 1.84535960e-09 9.99999998e-01] [ 22.00259842 21.503318 ] [ 3.10405335 2.76697561]

[ 1.85308003e-09 9.99999998e-01] [ 22.0376743 21.503318 ] [ 3.11191339 2.76697561]

[ 1.86157765e-09 9.99999998e-01] [ 22.07301399 21.503318 ] [ 3.11752746 2.76697561]

[ 1.87086831e-09 9.99999998e-01] [ 22.10849184 21.503318 ] [ 3.12078853 2.76697561]

[ 1.88096547e-09 9.99999998e-01] [ 22.14401391 21.503318 ] [ 3.12162601 2.76697561]

[ 1.89188168e-09 9.99999998e-01] [ 22.17952099 21.503318 ] [ 3.11999348 2.76697561]

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[ 1.92969058e-09 9.99999998e-01] [ 22.28591163 21.503318 ] [ 3.09991682 2.76697561]

[ 1.94404812e-09 9.99999998e-01] [ 22.32150665 21.503318 ] [ 3.08798883 2.76697561]

[ 1.95933348e-09 9.99999998e-01] [ 22.35735241 21.503318 ] [ 3.07327693 2.76697561]

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[ 3.84182466e-08 9.99999962e-01] [ 23.80541694 21.50331791] [ 0.16363162 2.76697551]

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S1:10,0.5

S2:25,1

S3:15,0.1

S4=0.5S1+0.5S2

S5=0.5S2+0.5S3

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EM(S5,6): [ 1.62327407e-28 3.09246678e-22 2.10193997e-16 6.00505013e-10

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25.00035062] [ 1.05954796 1.08826692 1.167423 0.50837939 0.00982851 1.0036078 ]