Code Report for EM Algorithm

Running results:

=======ALL PARAMETERS INITIALIZED.=======

INITIALIZATION STRATEGY 0

MIU[0]=10.606461679392922, SIGMA[0]=27.650709234725326, PI[0]=0.3781348428080481

MIU[1]=25.530840885626812, SIGMA[1]=0.9250565154211506, PI[1]=0.3251736783092891

MIU[2]=10.707673512801803, SIGMA[2]=27.745481470773758, PI[2]=0.2966914788826615

THE LOG LIKELIHOOD IS: -18776.603248872772

INITIALIZATION STRATEGY 1

MIU[0]=5.512035418302103, SIGMA[0]=1.0307806732367784, PI[0]=0.3333333337606485

MIU[1]=25.499404131405164, SIGMA[1]=0.9987585523122657, PI[1]=0.3333333333293466

MIU[2]=15.456889236902509, SIGMA[2]=0.9676594933091753, PI[2]=0.333333329100049

THE LOG LIKELIHOOD IS: -15100.00410680269

=======WITH VARIANCE FIXED TO 1.=======

INITIALIZATION STRATEGY 0

MIU[0]=25.499404131473643, SIGMA[0]=1.0, PI[0]=0.3333333333226426

MIU[1]=5.512035413737942, SIGMA[1]=1.0, PI[1]=0.3333333335234178

MIU[2]=15.456889234519029, SIGMA[2]=1.0, PI[2]=0.33333333315393954

THE LOG LIKELIHOOD IS: -15101.00501087722

INITIALIZATION STRATEGY 1

MIU[0]=15.456889234519029, SIGMA[0]=1.0, PI[0]=0.33333333315393954

MIU[1]=5.512035413737942, SIGMA[1]=1.0, PI[1]=0.3333333335234178

MIU[2]=25.499404131473643, SIGMA[2]=1.0, PI[2]=0.3333333333226426

THE LOG LIKELIHOOD IS: -15101.00501087722

Comparison:

As we can see, when it converges the log likelihood = -15100.00410680269, so if we randomly initialize all the parameters at first including variance, sometimes we'll get a better result.