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MISAEL MORALES - MATH 7993 NUMERICAL OPTIMIZATION - PROJECT
OPTIMIZATION OF MULTIVARIATE GAUSSIAN MIXTURE MODEL
Real Mu1: [-2.00, 3.00]
Real Mu2: [4.00, -5.00]
Real Sigma1: [2.00 0.00 ; 0.00 2.00]
Real Sigma2: [8.00 1.00 ; 1.00 8.00]
Real Proportions: [0.700, 0.300]
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Initial Guess Mu1: [-1.61, 3.39]
Initial Guess Mu2: [4.69, -4.31]
Initial Guess Sigma1: [11.34 -9.19 ; -9.19 16.86]
Initial Guess Sigma2: [11.34 -9.19 ; -9.19 16.86]
Initial Guess Proportions: [0.500, 0.500]
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EM-estimated Mu1: [-2.0146, 3.0777]
EM-estimated Mu2: [3.1995, -4.0501]
EM-estimated Sigma1: [1.884 0.028 ; 0.028 1.643]
EM-estimated Sigma2: [11.415 -2.301 ; -2.301 12.400]
EM-estimated Proportions: [0.6545, 0.3455]. Sum: 1.0000
Stopping Criteria: max iterations (10) | tolerance (1.0e-06)
Maximum number of iterations (10) was reached before convergence!
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Optimization Toolbox subroutine:

Exiting: Maximum number of iterations has been exceeded
        - increase MaxIter option.
        Current function value: 4554.868187


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NMS Optimization-estimated Mu1: [-1.9640, 2.9771]
NMS Optimization-estimated Mu2: [-1.9640, 2.9771]
NMS Optimization-estimated Sigma1: [2.046 0.027 ; 0.029 1.891]
NMS Optimization-estimated Sigma2: [8.945 -2.515 ; 1.402 8.638]
NMS Optimization-estimated Proportions: [0.7008, 0.2992]. Sum: 1.000
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Local minimum possible.

fminunc stopped because it cannot decrease the objective function
along the current search direction.

<stopping criteria details>
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QN Optimization-estimated Mu1: [-1.9638, 2.9770]
QN Optimization-estimated Mu2: [3.8613, -4.8822]
QN Optimization-estimated Sigma1: [2.043 0.028 ; 0.025 1.894]
QN Optimization-estimated Sigma2: [8.954 -2.301 ; 1.460 8.687]
QN Optimization-estimated Proportions: [0.6995, 0.3005]. Sum: 1.000
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EM-estimated Negative Log-Likelihood:        4578.5480
fminsearch Negative Log-Likelihood:          4554.8682
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fminunc Negative Log-Likelihood:               4554.8525
Original Parameters Negative Log-Likelihood: 4557.8738
Elapsed time is 7.540343 seconds.
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