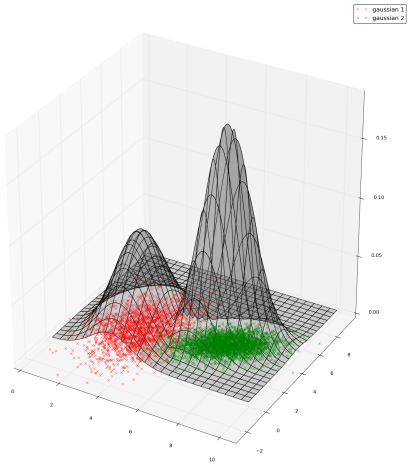
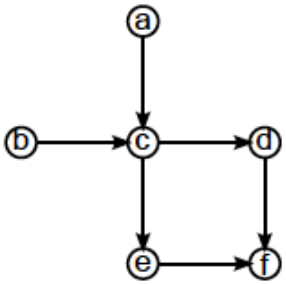
Vision
HW#2

1. The Gaussian 2-dimentional data on file 2gaussian.txt has been generated using a mixture of two Gaussians, each 2-D, with the parameters below. Run the EM algorithm with random initial values to recover the parameters.
   mean_1 [3,3]); cov_1 = [[1,0],[0,3]]; n1=2000 points
   mean_2 =[7,4]; cov_2 = [[1,0.5],[0.5,1]]; n2=4000 points
   You should obtain a result visually like this.



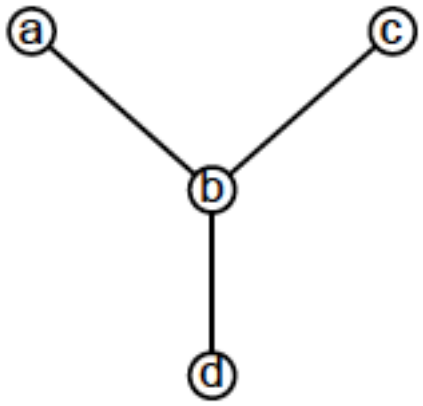
2. Same problem for 2-D data on file 3gaussian.txt , generated using a mixture of three Gaussians. Verify your findings against the true parameters used generate the data below.
   mean_1 = [3,3] ; cov_1 = [[1,0],[0,3]]; n1=2000
   mean_2 = [7,4] ; cov_2 = [[1,0.5],[0.5,1]] ; n2=3000
   mean_3 = [5,7] ; cov_3 = [[1,0.2],[0.2,1]] ; n3=5000

3. Consider the following graphical model:



- Write down the factorized probability distribution p(a; b; c; d; e; f) implied by this model.
- Write down how you would perform summations to efficiently compute p(f).
- Convert the above to an undirected graphical model, and write down the factorization implied by the undirected version.

4. Consider the following graphical model:



   Compute p(cId = 1) (i.e., compute both p(c = 0Id = 1) and p(c = 1Id = 1)).

5. Bishop 8.17.
6. Bishop 8.19.