# Assignment



- ML estimation
  - Derive the update formulas of the parameters $\pi, \mu, \Lambda$ (p. 22) by letting the partial derivative of the lower bound (p. 20) w.r.t. each parameter equal to zero.
  - Implement the EM algorithm.
- Bayesian estimation
  - Derive the variational posteriors of the parameters $\pi, \mu, \Lambda$ (p. 47) by using the formulas (p. 46)
  - Implement the VB and/or GS algorithm
  - Optional:
    - Implement the other algorithms for finite/infinite GMMs.

# How to Submit



- Report submission
  - Deadline: 7/21 (Sun)
  - “Assignments” on PandA
  - Upload two files
    - PDF file: Report document
    - Zip file: Codes and instructions (README)
- Program specification
  - *your_program_or_script* x.csv z.csv params.dat
  - Show the value of the likelihood or lower bound at each iteration
  - Output z.csv and params.dat
    - z.csv: Posterior probabilities of $z_n$

0.2, 0.3, 0.5
0.5, 0.1, 0.4
0.1, 0.8, 0.1
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