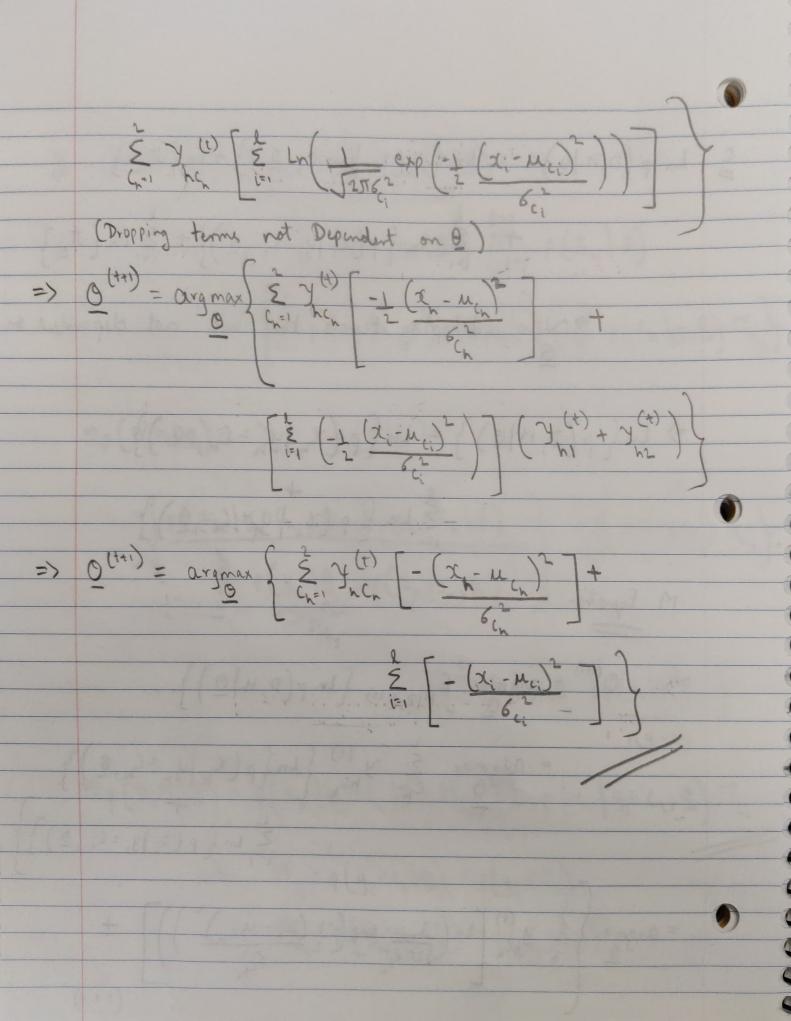
= Lo Hardik Prajapati (2678294168) Labeled Samples = l Unlabeled samples = U=1 features = 1 Pros & variances are constant Task: - Estimate u, M2 luing EM a) iteration: - th Estep: - Compute best est of H as p(HD, 0(t)) -> P(H)D, 0(1)) = JT P(Y) X D) 7, X DO(1) = Itu p(yn | xh ) = (+) p(n/D, o(t)) = p(yn/2, o(t)) = P(y=ch/2h)

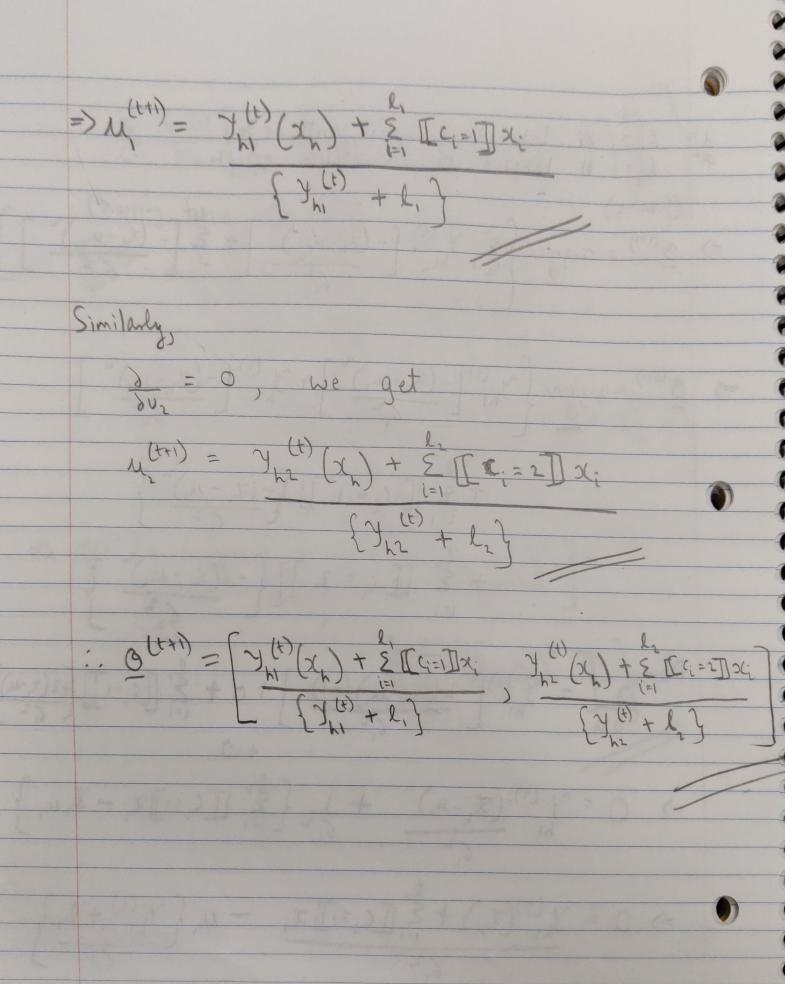
Now, Class of Labeled Samples with IT = Frequency of labeled samples with class 2 (Priors).

$$\frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2$$

6 In p (D, 10) Ln { p(x | y = c , 0)} + Ln { JT ( ) + & In { p(x; |y; = C; ) ) + & In { IT } How dropping terms that are not dependent on p(DH19) = - Lnfp1 (x/4=4,0) \$ Ln { p(x; | y = c; ,e)} Equation: -= argmax EHDOB (D,HO) = argmax & y(t) [Ln[p(x|y=C,0)] £ Ln { ρ(x, |y, = (, 0)) = argmax \ \frac{2}{C\_{n=1}} \ \frac{1}{C\_{n}} \left[ \frac{1}{2\pi 6c\_{n}} \left[ \frac{1}{2\pi 6c\_{n}} \left[ \frac{1}{2\pi 6c\_{n}} \left] \right] + (P. T. U)



=) 9(t1) = argmax (\$\frac{1}{2} \gammax (\frac{1}{2}) \frac{1}{2} 0 (th) = arg max (y (t) [-(x,-m)] + y (t) [-(x,-m)] - (x,-m)] + E [ [ c = 1] [ - (x; - m,) ] + £ [[ (= 2]] { - (x; -u,) } } Now, = y (+)[-2(x,-u)(-1)] + 0 + & [[(=1]] (+2(x,-u))]  $\Rightarrow 0 = y(t)(x_n) + \sum_{i=1}^{k} [C_i = i]x_i - \mu(y_i(t) + \ell_i)$ 



e i) 
$$f_{n1}(t) = 0.3486$$
 (Also computed on computer)  
 $f_{n2}(t) = 0.6513$  (code file)  
 $f_{n2}(t) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2} \left(3 - 1.5\right)^{2}\right) \cdot 0.5$ 

= 0.0647588 0.064788 + 0.120985

= 0.3486

J (t) = 0.651359

$$u_1(t+1) = (0.3486)(3) + (1+2)$$

$$(0.3486) + 2$$

= 1.72264327

$$\mu_2(t+1) = (0.6513)(3) + (4)$$

= 3.60558