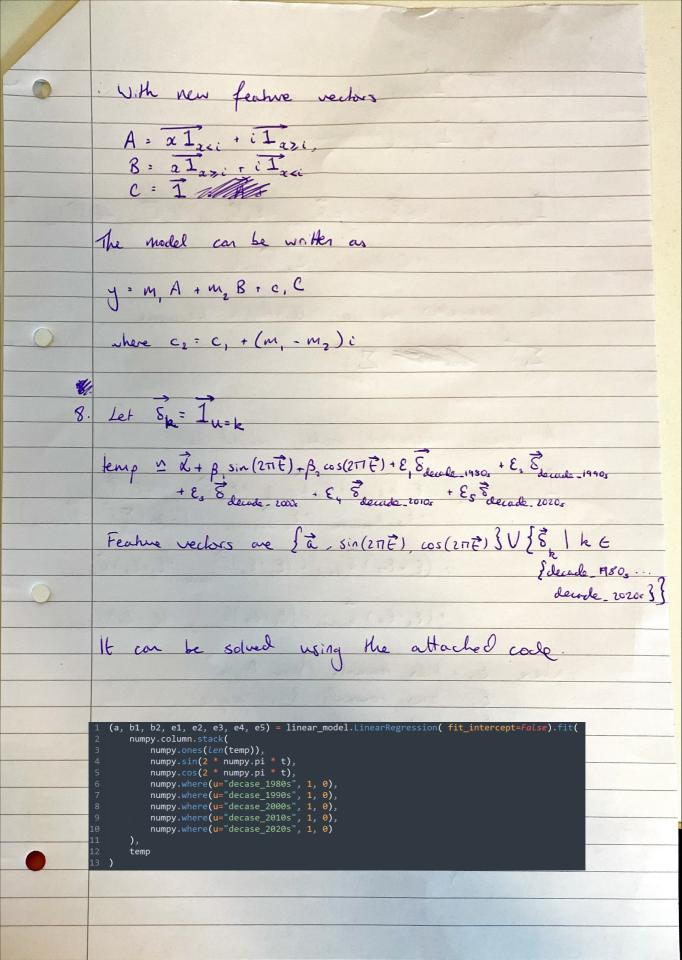
Data Science Supervision 1 5. PDF of a normal dishibution is $\sqrt{-1/2} e^{-\frac{1}{2}(\frac{x-x}{\sigma})^2} = f(z)$: log (f(z)) = constart - log (o) - 1 (x-h)2 log (like lihood) = (I log (fa(1))) + (I log (fa(y))) assuming independence = (\(\frac{\sum_{\log}(\sigma) - \frac{1}{2} \left(\frac{\pi_{\log}(\sigma)}{\sigma} \right)^2 \right) - \left(\frac{\pi_{\log}(\sigma) - \frac{1}{2} \left(\frac{\pi_{\log}(\sigma)}{\sigma} \right)^2 \right) \) Samples of The Total = constant - (m+n) log or - 202 ((2 (a:-m)2) + (2 (y:-m-888)2)) 2 log (the thool) = - 1/20 2 [-2 (y - 1 - 5) = 1 (ny -nm-n8) dog(likelihood) = - 202 ((∑-2(x;-μ))+(∑-2(y;-μ-δ))) = 1 (mx -mu + ny -nu-ns) = to2 (mx-mu+0) · = = = 8 = g - x



10. Let Vk = Igerder = k, Sh: I esh = k 1 outrone = first = E & Asian + E & Stack + E & Emixed + En Some + E & Swhite + E Terrole + E, Finale the parameters are not identifiable because ES: Zy A linearly independent model would be: 1 outrane: find = E, E Asian + E, E Black + E, E mixed + E, Tother + Es France + E, France + E, France + E, France + E, France : (E, + E7) 3 Asin + (E, + E7) 8 Black 1(E3+ E7) 8 mixed + (E, 1 E7) Some + (E5+ E7) Sunite + (E6- E7) & Female where E, = bias bowards Asian Beggle Ez: bias towards Black people
Ez: bias towards Mixed race people
Ey: bias towards people of other ethnicities Es: bias towards white people Es: bias powerds femilles Ex : bias sowards Males