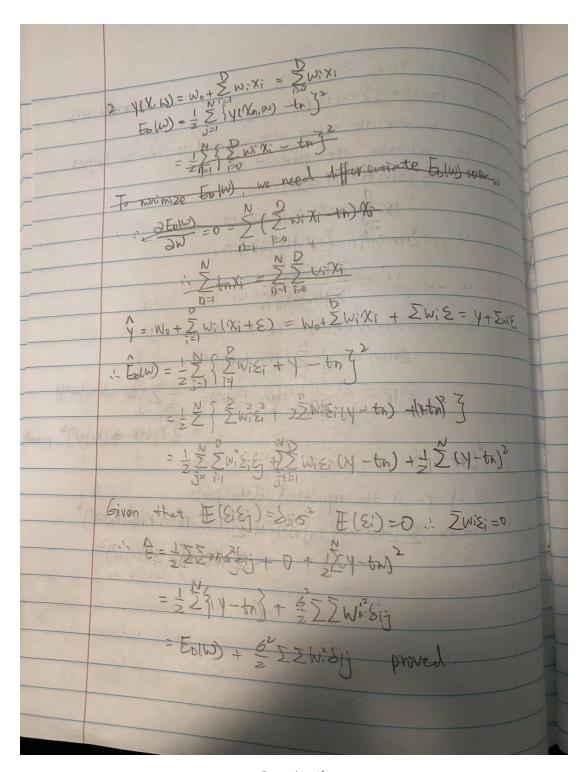
Horework 2 ML Mar 5th 2013 1. Ex (W) = \frac{1}{2} \Sigma roltn - WT \p(\frac{1}{2} \sigma)^2 1. Ex (W) = \frac{1}{2} \Sigma roltn - WT \p(\frac{1}{2} \sigma)^2
To minimize the square error, we need to find the largest w.T. So take the gradient w.T. 2 \frac{1}{2}\Sinctin - w.T \phi(xn))^2 = 0
5 rn(tn - w/ (xn)) &(xn) = 0 2 rn tn pn Zwi A(xn) p(xn) rn
DASSIME EI - N(0,62) SO YIN N(XIWT,62)
$\frac{1}{2} \frac{1}{2} \frac{1}{2} \left[\frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \frac{1}{2} \right) + \frac{1}{2} \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \frac{1}{2} \frac{1}{2} \right) + \frac{1}{2} \frac{1}{2} \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} $
$= \sum_{x} r_n (t_n - 4(x_n) w^{-1})^2 proved$
then \(\tan\) w\(\tan\) w\(\tan\) \(\tan\)
ZVNCCNST
Large Chart & Control

Question 1a



Question1b

1,56%	No. of the last of
	1 Ashrar wat a
	HWZ Question 3
	HWZ Question 3 From the formula 13.19) in the textbook:
	noise weentality
	05)
6	5N = SO + BAAT => ST + BZ & (XXX)
	Therefore ST = SN + B & (XN+1) & (XN+1) T
	: SAND - SAND = A (XMM) (SAND - SA) 4 (MMM) TO
	Now, Given the formula from the question,
	(NT W) = ST + JBA (Man) JBA (Man) - Sm
	THE ST V=JBp(SEWH)
	1 - Som = Soit - Conted (Som) (JED) (Som) Sond (Som)
	So replace Shi-Sh in O by O
	STORY ST SISTER (NAM) (TBA (NAM) SWALNANT B
	HJBP (Many) >n P (Minor)
	Knowing that 4(2014), JB, SN, I are all possitive
	so Q is negative
	which means one (M)-on (M) <0 & SHU(M) < Gray)

Question1c

4. p(w, t) & (T) N(ta; y(xnw) 62)) × (N(w) 0, 6, 7)) Given the Graussian prior the likelihood can be written p(t/w)= TV(tn; wtq(kn), q2) so the posterior can be written in form of Graussian as the productof prior: p(w/ozI)= /ZTST exp(- ZWToZW) take the In out suppose $\beta = G^2$ $\alpha = G_2^T$ Whiteed: In p(W|\alpha) = -\frac{N}{2} In WTWA - \frac{N}{2} In \text{2TT} = -\alpha \text{Ew(w)} + const and p(tilw) = 1 H exp(- ltn-wto M)2) In p(+1 w) = 1 2 (+n w + (Xn)) = + (n (2p-1)-2 = = = (tn-w1 + (xn)) B+ const -BEB(W) Therefore to maximize Inplu/a) t In (W/B) which is derived from argnex p(w/x). pttw) = ln(w/a) + ln(+++) can be written as - a Ewlw + & Eolw if he derard the constant term that don't depend on W. Therefore wax posterior & equivalent to max - (a Ewlw)+BEd which is minimization of & Fulw + BEOLW)

Question 1d

Question2

https://colab.research.google.com/drive/1tNr-Jz3DrmaUb360j9fDPYYs2ZjTweol?authuser=1#scrollTo=XmJ_Ei7bYV6I