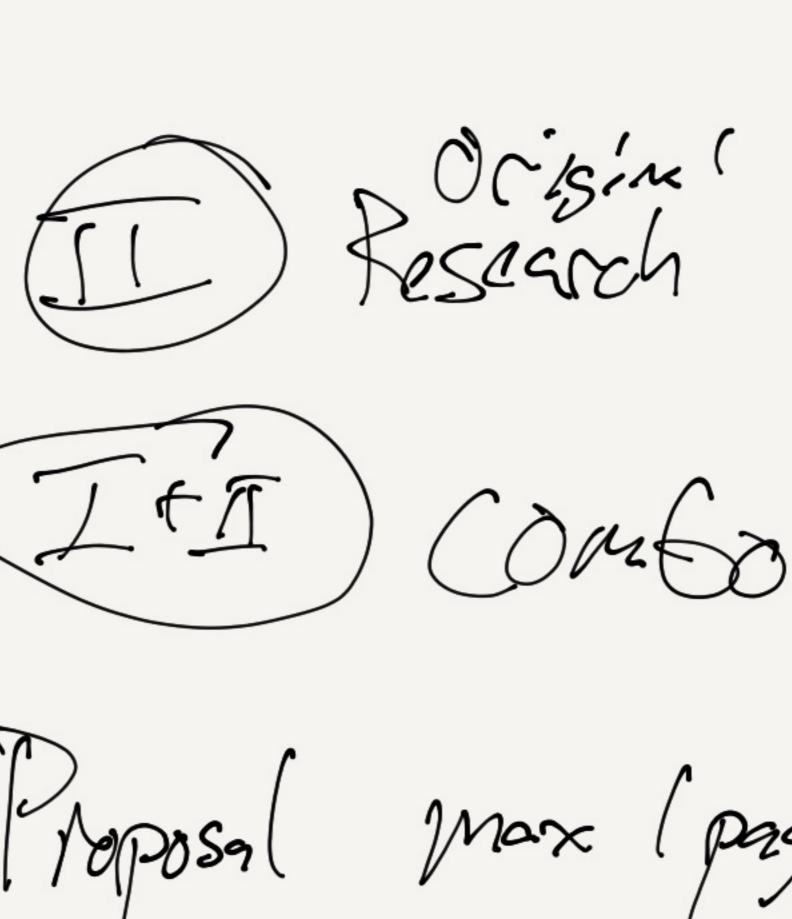
Online Regression via O.G.D. Research Logistica Commentso Project instructions are now on website Components of Plaject: * Danasa Short Plesentstion * Report Teams of Sasvey - topo



Poposa (page Team menbers I Luithal survey medate end af next wedend

Sec websheforme?

Online regression: (LINEAR) LITT Arbitrary verponse X+ Context JE SPONSE Q How is response generated?

- Yt is chosen by Mator Compete w/ best linear Predictor wx

Goal: Minimize Fragret Regret = = = ((\wx-Wt/Xt/) Algorithm o Gradient Descent 19 mine $\mathcal{L}(y,y)-(y-y)$ $\frac{1}{3}\left(\frac{1}{3}\right)^{\frac{1}{3}}-\frac{1}{3}\left(\frac{1}{3}\right)^{\frac{1}{3}}$ - 2 (G - y)

9-t= < Wt Xt $\mathcal{H}, \mathcal{L}(\mathcal{Y}, \mathcal{X}_{+})$ = 2 (< w, xt)-y) X+ Wer $W_{t} = W_{t-1} - 2 + W_{t-1}(y_{t}, w_{t-1})$ 5605120 $- \mathcal{W}_{t-1} - 2\mathcal{P}(\langle \psi_{t} \times_{t} \rangle - y) \chi_{t}$ Wt-W*/(- (1 Wf-1 - W# - 29 (Wz-1 - W# Xx) · X / / Z

-47 (Wt.,-W*, Xt) = [[w*-woll² +] 4m² ||xe|| (we., w/xe)

422 Degset D=-47 (Regnet)

0 = ||w*-woll + 4 n2 R2 (Roght) - 4n (Roght)

27 Regret) = 1/w* - Wo[1] $\mathcal{U} = \frac{1}{2R^2}$ $(Regrei) \subseteq R^2 ||\omega + \omega_0||^2$ 2 (WK-We-1/Xt)

Stochastie Case: We-1-29((W+1)X+)-4)X yt= < w* xt> + 3e, = We-1-221(<Co-w*x2) -50)x 1/ W_- W*// = 11 We-in will + 42/1/2/((\we-in-winxe)-3+) - ?m ((We,1-W*,Xe) - 3e) $\langle \omega_{\epsilon-1} - \omega_{\star} \rangle$ Inequality: (a+b) $\leq 2a^2+26^2$ $((u_{t-1}-w_{1}^{*})_{-} - 3e)^{2} \leq 2(w_{t-1}-w_{1}^{*})_{x_{1}}^{2} + 3e$

ASSUME: # 52 = 52 E | WE-W* 112 = E | WE-1-W* 112 + 822 / (FW*-U+1, XE) - 49/KW-W-1, X--W*11 = 11 (Wo-W*11 + 892 (2 (ERegret) 5 = 162-6*119+8-29(# Regret)

It Regart C T (8+ 11w*-colf)

Max { or 57, 4 r² 3 (8+ 1/w*-woll)