Linear regression: y=autaxi

g:= a. + a. X i; + E;

Where: is the observation of the ith

term

This can be expressed in terms uf

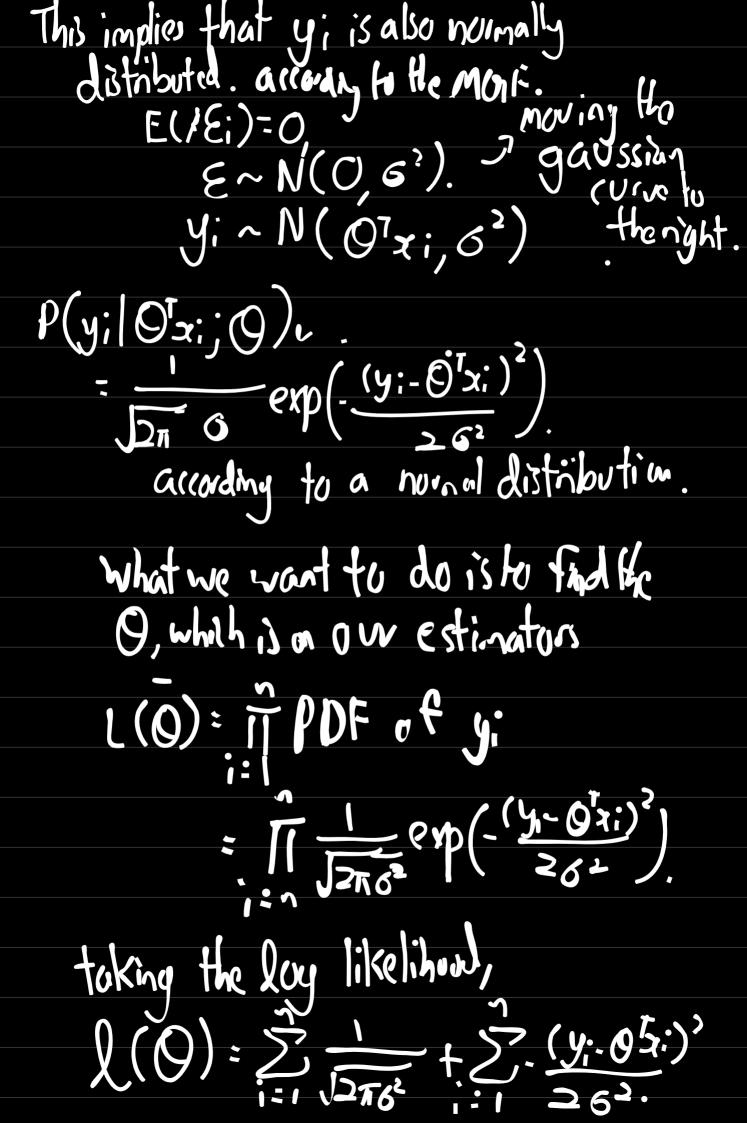
y=01x fE [B,] replacing where 01= Bo] ao a.

and x: [>(, xo] where xo=1.

Weare iven yi, and weknow (9. Assuming that the term yi are i.i.d, theat mean)

Ei is also i.id.

Since our dataset is huge, it is reasonable to assure Ei is normally distributed, henc,



Since we want to maximize 2(0),
we have turnhimize $3(4i-03i)^2$ 36^2 is a constant,

Thus given us $2(4i-03i)^2$.

Here, we assume me want our data to be centered, hence $x_{i}=(x_{i}-x)$ rewritter. $\sum_{i=1}^{n} (y_{i}-b_{0}-b_{i}(x_{i}-x))^{\frac{n}{2}}=e$.

 $\frac{\partial e}{\partial b_0} = \sum_{i=1}^{5} 2 \left[y_i - b_0 - b_1(x_i - \bar{x}) \right] (-1)$ $= \sum_{i=1}^{5} \frac{b_0 + b_1(x_i - \bar{x}) - y_i}{2}$

 $= 0. = 2y + nb_0 + b_1 \hat{z}(x - \hat{z})$

For a centered bo, bo = J.

but how did we get bo?

Let bu be the non-exentered.

Let us discover about bithen.

$$\sum_{i=1}^{n} (y_i - b_0 - b_1(x_i - \bar{x}))^{\frac{1}{n}}$$

$$\sum_{i=1}^{n} 2(y_i - b_0 - b_1(x_i - \bar{x}))(x_i - \bar{x})$$

$$\sum_{i=1}^{n} y_i(x_i - \bar{x}) - nb_0 - \sum_{i=1}^{n} b_i(x_i - \bar{x})^{\frac{1}{n}}$$

$$\sum_{i=1}^{n} y_i(x_i - \bar{x}) \rightarrow nb_0$$

$$\sum_{i=1}^{n} y_i(x_i - \bar{x})^{\frac{1}{n}}$$

50 now we have bob.