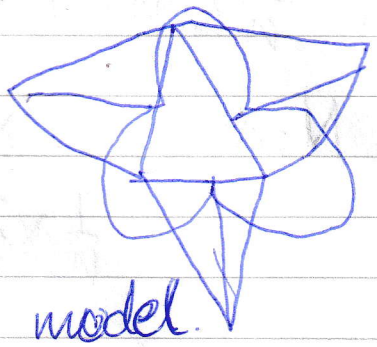
$$Y_i = X_i^T \beta + \varepsilon_i$$

$$\Rightarrow X_i Y_i = X_i X_i^T \beta + X_i \varepsilon_i$$

$$\Rightarrow (X_i X_i^T)^{-1} X_i Y_i = \beta + (X_i X_i^T)^{-1} X_i \varepsilon_i$$



meter

This is a signal + noise model.

& can just consider the model.

$$Y_i = \beta + \varepsilon_i$$ (where the Y_i are dim p vectors)

test-statistic is:

$$\frac{\frac{1}{n}\sum_{i=1}^{n} \hat{C}(X_i X_i^T)^{-1} X_i Y_i}{\hat{\sigma}\left(\hat{C}((X_1 X_1)^T)^{-1} X_1 Y_1, \ldots\right)}$$

using $X_i Y_i^T$ instead of $X_i^T X_i$ $= \sum X_i X_i^T$

introduces extra randomness into the model!

(can just transform component wise then right?)