Multiple Linear Regression

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$$\hat{y} = b_0 + b_1X_1 + b_2X_2 + \cdots + b_nX_n$$

- $\hat{y}$: Dependent variable
- b_0: y-intercept (constant)
- b_1: Slope coefficient 1
- X_1: Independent variable 1
- b_2: Slope coefficient 2
- X_2: Independent variable 2
- b_n: Slope coefficient n
- X_n: Independent variable n

Multiple Linear Regression

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$$Potatoes[t] = 8t + 3\frac{t}{kg} \times Fertilizer[kg] - 0.54\frac{t}{°C} \times AvgTemp[°C] + 0.04\frac{t}{mm} \times Rain[mm]$$

Additional Reading

The Application of Multiple Linear Regression and Artificial Neural Network Models for Yield Prediction of Very Early Potato Cultivars before Harvest

Magdalena Piekutowska et. al. (2021)

Link:

https://www.mdpi.com/2073-4395/11/5/885

Quantitative Yield Forecast		
Models RY1 and NY1	Yield Forecast before Harvest (40 Days from Full Emergence)	Data Range
INSO	insolation sum [h] in the periods: planting—June 20,	275.3–711.7
TEMP	average daily air temperature [°C] in the periods: planting—20 June	10.8–15.7
PREC	precipitation [mm] in the periods: planting—20 June	38.7–258.2
NITRO	sum of nitrogen fertilization [kg·ha^{-1}] in the periods: planting—20 June	80–155
PHOSP	sum of phosphorus fertilization [kg·ha^{-1}]	28.2–150
POTAS	sum of potassium fertilization [kg·ha^{-1}]	80–306.5
PLANT	planting date [number of days since the beginning of the year]	107–127
EMERG	date of emergence [number of days since the beginning of the year], yield forecast 20th of June	130–151
DENST	densification [plants/plot], yield forecast June 20	35–60
PH	Soil pH [in 1 mol KCl]	5.8–7
SFERTP	soil fertility in phosphorus [mg P_2O_5·100 g^{-1} soil]	14–26.2
SFERTK	soil fertility in potassium [mg K_2O·100 g^{-1} soil]	11.7–19.2
SFERTM	soil fertility in magnesium [mg Mg·100 g^{-1} soil]	3–9.1
YIELDP1	tuber yield [t·ha^{-1}], harvest 40 days from full emergence	11.6–41.3