$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{pmatrix} \quad 2 \times 3$$

$$B = \begin{pmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \\ b_{31} & b_{32} \end{pmatrix} \quad 3 \times 2$$

Row 1 × Col 1.
Row 1 × ~~Row~~ Col 2.
Row 2 × Col 1
Row × Col 2
Row × Col.

$$A \times B = \begin{pmatrix} a_{11}b_{11} + a_{12}b_{21} + a_{13}b_{31} = c_{11} & a_{11}b_{12} + a_{12}b_{22} + a_{13}b_{32} = c_{12} \\ c_{21} & c_{22} \end{pmatrix} \quad 2 \times 2$$

Simple Data

Q1. How can we predict the regression? Same as simple sample data

Q2 How can we import the data from SPSS?

Q3 After importing, how we can run multiple regression in R.

Q4. How can we plot graph in R. Scatter Diagram

relation ← lm(y ~ x)

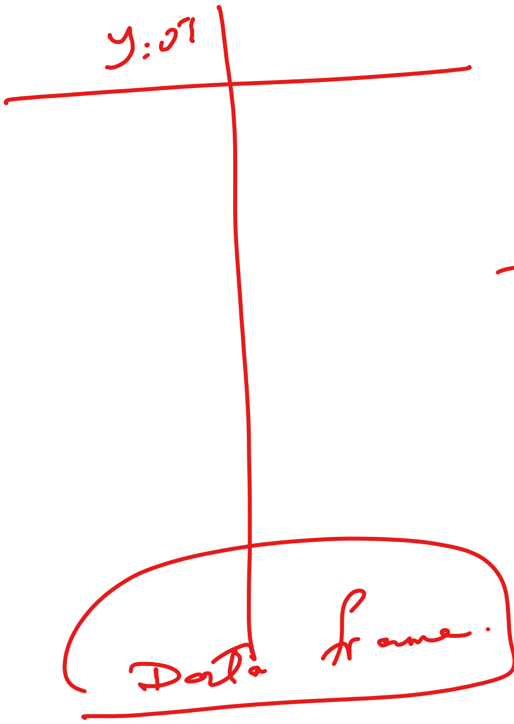
linear model. (Drawn in) tilde sign

$$y = c + bx$$

$c = -38.4551$
$b = 0.6746$

weight = $-38.4551 + 0.6748 * (x)$ height

R R^2



Print (Rel & L)

Summary (variables)

Print

$y = x^2$. Alg.

$y = e^{x^2}$. Exp (Alg)

Function of Forecast

10 variables.

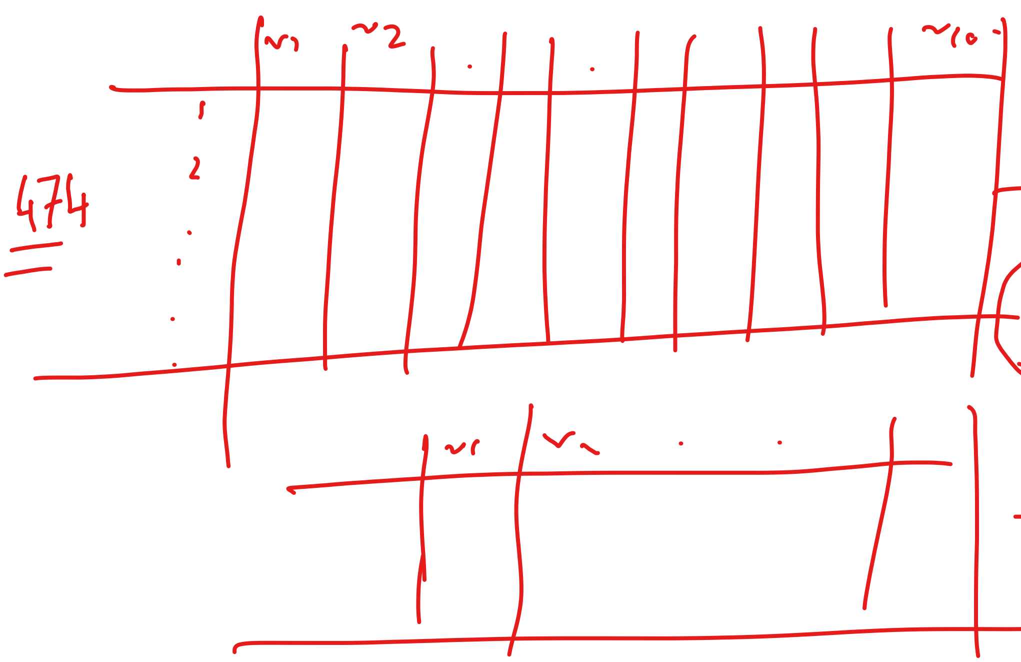
1 DV.

6 IV.

3 Demographic variables.

7 variables.

MR.



Master file

474×10

Transaction

474×07

y	x
.	.
.	?
.	.
?	?

$y = -38.4551 + 0.67 \times x$

we want to predict the y for some given values of x.

Apply concept of data frame

Initial

observed

y	x	Predict $\hat{y} = 38.45 + 0.67x$	Error $= y - \hat{y}$	$(\text{Error})^2$
63	151	64	true	
✓	✓	✓		
✓	-	✓		
	-	✓		
-	✓	✓		
-	-	✓		

$$\boxed{R^2 = 1 - \frac{SSE}{TSS}}$$

$\sum(\text{Error})^2 = ESS \quad SSE$

$TSS = \sum(O_y - \bar{O}_y)^2$

$= \sum(y - \bar{y})^2$

Problem of R^2.

independent of no. of independent variables and no. of observation

Solution: Modified R^2 = Adjusted R^2.

with the help of no. of Ind. and no. of observation

$$\text{Adjusted } R^2 = 1 - \frac{SSE/(n-k-1)}{TSS/(n-1)}$$

Where. || n = no. of observations.
k = no of ind. variables.

$$\text{Adj } R^2 \le R^2$$

n − k − 1 = Degree of freedom for SSE.
n − 1 = D.f for TSS.

n = 10

y	x

k = 1   10 − 1 − 1 = 8

Adj R^2 & R^2.

$R^2 = 0.8$
Adj $R^2 = 0.6$ (always)   0.2

Ans:. no of observation is less.
& also no of IV's are less.
no of variables = 20

10 | |

Possible

When no of obs. < no of variables

Appln. Forward Stepwise Regression.

$\hat{R}^2$ Adj R^2 → involving with Degree's of freedom (DF)

Concept of DF.

DF = No. of independent Parameters.

3 variables | $x + y + z = 6$
1 eqn | $z = 6 - x - y$

$z = f(x, y)$ z = Dv.

How many $\approx$ $= 2$ $x = 1, y = 2$ $z = 3$ x, y = Iv.

$x = 6, y = 1$ $z = -1$

DF $= 3 - 1$.

2 4 6 8 5.

$\bar{x} = \frac{2+4+6+8+5}{5} = 5$ $\bar{x} = \frac{\sum x_i}{n}$

$\bar{x}$ is known

we want to estimate σ^2 = sample variance

$\sigma^2 = \frac{1}{n-1} \sum (x_i - \bar{x})^2$ → Parameter.

10 variables.

Employee. Dv. → 1 Dv. = Current Salary.

6 Iv.

1. Beginning Sal / x_1
2. Previous Exp: x_2
3. Minority classifications x_3
4. Qualification x_4
5. Monthly Since Hiring x_5
6. Employment Category x_6

$\Sigma \sim$

Obj. Current salary $= f(x_1, x_2 \ldots x_6)$

1. Import the file from SPSS.

$x_1 \sim$ char.

$x_2 \sim$ numeric.

Reg.

Dv ~ numeric.

Iv , numeric.

Current salary → y

fn → x_1

MISSING Analysis.

NAP. → Not applicable.

NA. → Not available.

DK. → Do not know.

		Remark.
R1.	✓ ✓ ✓ ✓ ✓	no missing.
R2	✓ ✓ x x ✓ ✓	Missing for. col 3, col 6
⋮		

474

NA → 0 =

Missing.

5 Q1

Based on five scale.

1. 2 3 4 5.

Strongly Disagree. Disagree ~~neutral~~ Average Agree Strongly agree.

1 2 3 4 5 6 7. 0 8 9.

NA DK.

0 8 9.

1 2 3 . . . 9. 00 98 99