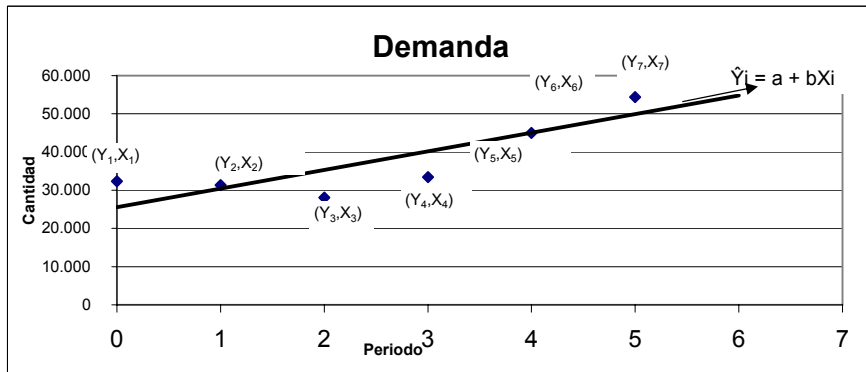


PROYECCIÓN A TRAVÉS DEL MÉTODO MÍNIMOS CUADRADOS

x	y
Año	Demanda
0	32.350
1	31.305
2	28.083
3	33.408
4	44.987
5	54.344
6	56.830



$$Y_i = a + bX_i$$

$$\begin{aligned} d_1 &= Y_1 - \hat{Y}_1 \\ d_2 &= Y_2 - \hat{Y}_2 \\ d_3 &= Y_3 - \hat{Y}_3 \\ d_4 &= Y_4 - \hat{Y}_4 \\ d_5 &= Y_5 - \hat{Y}_5 \end{aligned}$$

$$\begin{aligned} d_1^2 &= (Y_1 - \hat{Y}_1)^2 \\ d_2^2 &= (Y_2 - \hat{Y}_2)^2 \\ d_3^2 &= (Y_3 - \hat{Y}_3)^2 \\ d_4^2 &= (Y_4 - \hat{Y}_4)^2 \\ d_5^2 &= (Y_5 - \hat{Y}_5)^2 \end{aligned}$$

$$\sum d_i = Y_i - Y_i = 0$$

$$\sum d_i^2 = \sum (Y_i - \hat{Y}_i)^2 \neq 0$$

$$\frac{\partial \sum (Y_i - \hat{Y}_i)^2}{\partial a} = 0$$

$$\frac{\partial \sum (Y_i - \hat{Y}_i)^2}{\partial b} = 0$$

$$\frac{\partial \sum (Y_i - a - bX_i)^2}{\partial a} = 0$$

$$\frac{\partial \sum (Y_i - a - bX_i)^2}{\partial b} = 0$$

$$\frac{2 \sum (Y_i - a - bX_i)}{\partial a} = 0$$

$$\frac{2 \sum (Y_i - a - bX_i)}{\partial b} = 0$$

$$2 \sum (Y_i - a - bX_i) (-1) = 0$$

$$2 \sum (Y_i - a - bX_i) (-X) = 0$$

$$\sum (Y_i - a - bX_i) (-1) = \frac{0}{.2}$$

$$\sum (Y_i - a - bX_i) (-X) = \frac{0}{.2}$$

$$(-\sum Y_i + \sum a + b \sum X_i) = 0$$

$$(-\sum X_i Y_i + \sum a X_i + b \sum X_i^2) = 0$$

$$\sum a + b \sum X_i = \sum Y_i$$

$$a \sum X_i + b \sum X_i^2 = \sum X_i Y_i$$

$$na + b \sum X_i = \sum Y_i$$

$$a \sum X_i + b \sum X_i^2 = \sum X_i Y_i$$

1ra. Ecuación

2da. Ecuación

EJEMPLO DE PROYECCIÓN A TRAVÉS DEL MÉTODO MÍNIMOS CUADRADOS

x	y	XY	X ²
0	32.350	0	0
1	31.305	31.305	1
2	28.083	56.166	4
3	33.408	100.224	9
4	44.987	179.948	16
5	54.344	271.720	25

$$na + b \sum X_i = \sum Y_i$$

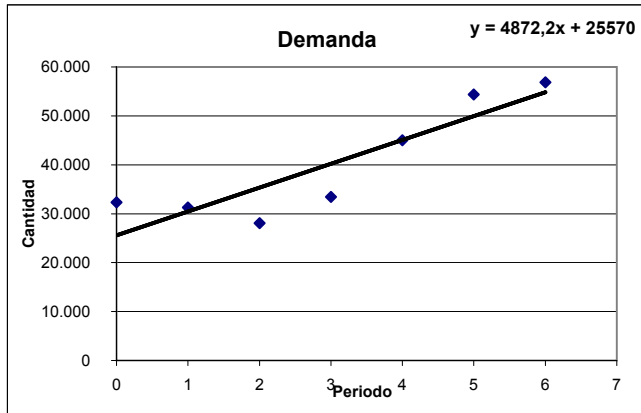
$$a \sum X_i + b \sum X_i^2 = \sum X_i Y_i$$

$(7*a) + (21*b) = (281307)$	-21
$(21*a) + (91*b) = (980343)$	7

a	b
---	---

6	56.830	340.980	36
21	281.307	980.343	91

7



7	21	281.307
21	91	980.343

-147	-441	-5907447
147	637	6862401
0	196	954954

$$196b = 954954$$

$$b = 4872$$

$$(7 \cdot a) + (21 \cdot b) = (281307)$$

$$(7a) + (21 \cdot 4872) = (281307)$$

$$(7a) + (102317) = (281307)$$

$$(7a) = (281307) - (102317)$$

$$a = 178990 / 7$$

$$a = 25570$$

102.317
178.990
25.570

PROYECCIONES

$\hat{Y} =$	a +	b	X
25570	25.570		0
30442,21	25.570	4.872	1
35314,42	25.570	4.872	2
40186,63	25.570	4.872	3
45058,84	25.570	4.872	4
49931,05	25.570	4.872	5
54803,26	25.570	4.872	6
59675,47	25.570	4.872	7
64547,68	25.570	4.872	8
69419,89	25.570	4.872	9
74292,1	25.570	4.872	10
79164,31	25.570	4.872	11

X	$\hat{Y} =$
0	25570
1	30442,21
2	35314,42
3	40186,63
4	45058,84
5	49931,05
6	54803,26
7	59675,47
8	64547,68
9	69419,89
10	74292,1
11	79164,31

DATOS PROYECTADOS

