```
@RELATION conjunto_entrenamiento_datos

@ATTRIBUTE kpi_tiket_medio REAL
@ATTRIBUTE kpi_cifra_ventas REAL
@ATTRIBUTE kpi_margen_comercial REAL
@ATTRIBUTE kpi_rotacion_stock REAL
@ATTRIBUTE kpi_coef_rentabilidad REAL
@ATTRIBUTE kpi_cobertura_stock REAL
@ATTRIBUTE cantidad REAL
@ATTRIBUTE kpi_anho REAL
@ATTRIBUTE kpi_mes REAL
@ATTRIBUTE kpi_semana REAL
@ATTRIBUTE resultado {'Nada','Poco','Medio','Mucho'}

@DATA
6.412,488500,20.766,0.377,38194,18.000,109,2013,12,49,Nada
3.667,247500,23.094,0.191,10896,5.643,55,2013,12,50,Nada
1.375,49500,18.586,0.021,190,6.145,11,2013,12,51,Nada
1.222,49500,23.737,0.015,181,12.480,11,2013,12,52,Nada
0.667,9000,31.131,0.003,8,27.390,2,2013,12,53,Nada
1.000,13500,31.131,0.005,20,79.750,3,2014,1,1,Nada
1.000,18000,20.727,0.008,30,111.188,4,2014,1,2,Nada
1.000,13500,23.737,0.009,29,131.000,3,2014,1,3,Nada
1.333,18000,16.655,0.018,54,78.300,4,2014,1,4,Nada
4.500,324000,31.145,0.389,39273,2.415,72,2015,10,42,Poco
5.370,652500,31.145,0.876,178047,3.778,145,2015,10,43,Nada
3.167,85500,31.145,0.110,2916,1.061,19,2015,10,44,Poco
4.300,193500,31.145,0.185,11146,3.229,43,2015,11,45,Nada
3.818,189000,31.145,0.221,13012,3.058,42,2015,11,46,Nada
4.786,238500,12.957,0.161,4977,4.875,67,2015,11,47,Nada
6.923,630000,11.472,0.314,22703,13.086,180,2015,11,48,Nada
5.407,511000,11.472,0.327,19190,5.014,146,2015,11,49,Nada
6.098,875000,11.472,0.880,88362,3.122,250,2015,12,50,Poco
6.806,738500,11.472,2.654,224854,0.828,211,2015,12,51,Medio
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10.179,997500,11.455,1.588,181413,1.404,285,2015,12,53,Poco
7.037,665000,11.455,10.270,782312,0.154,190,2016,1,53,Medio
8.800,1078000,11.455,0.777,95919,0.221,308,2016,1,3,Medio
5.973,1568000,11.455,0.818,146832,7.588,448,2016,1,4,Nada
7.825,1095500,11.455,1.950,244714,1.258,313,2016,1,5,Poco
5.636,434000,11.455,0.193,9572,0.011,124,2016,2,6,Medio
6.595,854000,11.455,0.210,20506,4.353,244,2016,2,7,Poco
7.065,1137500,11.455,0.369,48093,4.599,325,2016,2,8,Poco
10.792,906500,11.455,0.441,45776,3.104,259,2016,2,9,Poco
6.968,756000,11.455,0.615,53290,1.659,216,2016,3,10,Poco
6.771,829500,11.455,1.888,179432,0.915,237,2016,3,11,Medio
8.250,577500,11.455,0.600,39690,0.029,165,2016,3,12,Medio
7.250,812000,11.455,0.543,50535,2.636,232,2016,3,13,Medio
5.750,805000,11.455,1.173,108204,1.472,230,2016,4,14,Poco
11.120,973000,11.454,1.823,203167,0.388,278,2016,4,15,Medio
7.276,738500,11.454,0.984,83210,0.908,211,2016,4,16,Medio
6.667,420000,11.455,0.242,11651,0.855,120,2016,4,17,Medio
7.886,966000,11.455,0.425,47056,3.872,276,2016,5,18,Poco
7.810,574000,11.455,0.381,25047,2.530,164,2016,5,19,Poco
7.345,745500,11.455,0.878,75005,1.870,213,2016,5,20,Poco
9.095,668500,11.455,1.394,106756,0.625,191,2016,5,21,Medio
6.821,668500,11.455,2.768,211965,0.729,191,2016,5,22,Medio
8.667,819000,11.455,0.352,33011,2.235,234,2016,6,24,Medio
6.286,308000,11.455,0.121,4259,4.282,88,2016,6,25,Nada
3.412,203000,11.455,0.149,3458,3.223,58,2016,6,26,Nada
1.143,28000,11.455,0.072,231,1.713,8,2016,7,27,Nada
7.600,532000,11.455,2.187,133275,0.097,152,2016,7,28,Medio
7.278,1001000,18.885,2.130,402667,1.844,262,2016,7,29,Poco
5.778,1248000,22.523,4.026,1131588,0.796,312,2016,7,30,Mucho
6.556,1416000,22.523,1.566,499550,0.178,354,2016,7,31,Medio
7.067,848000,22.523,0.700,133632,1.322,212,2016,8,32,Medio
6.300,756000,22.523,0.982,167176,0.673,189,2016,8,33,Medio

# Matriz de confusión

| Real (A) | | Predicción (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a = Nada | b = Poco | c = Medio | d = Mucho | | |
| | a = Nada | **95** | 4 | 0 | 0 | 99 | 0,6781 |
| | b = Poco | 2 | **17** | 4 | 0 | 23 | 0,1575 |
| | c = Medio | 0 | 4 | **15** | 2 | 21 | 0,1438 |
| | d = Mucho | 0 | 0 | 0 | **3** | 3 | 0,0205 |
| | | 97 | 25 | 19 | 5 | 130 | |

| 0,6644 | 0,1712 | 0,1301 | 0,0342 |
|---|---|---|---|

| Total Number of Instances | 146 |
|---|---|
| Correctly Classified Instances | 130 |
| Incorrectly Classified Instances | 16 |

| Exactitud | 0,890 | Exactitud = (TP + TN) / (TP + TN + FP + FN) | (95+17+15+3) / (95+17+15+3+4+4+2+2+4) |
|---|---|---|---|
| Precisión (Poco) | 0,680 | Precisión = (TP) / (TP + FP) | (17) / (17+4+4) |
| Sensibilidad o Recall (Poco) | 0,739 | Sensibilidad = (TP) / (TP + FN) | (17) / (17+2+4) |
| Medida F (Poco) | 0,708 | Medida = (2 * Sensibilidad * Precision) / (Sensibilidad + Precision) | (2*0.739*0.680) / (0.739+0.680) |

| P(A-Nada)*P(B-Nada) | 0,451 | La probabilidad de que ambos evaluadores digan "Nada" al azar. | |
|---|---|---|---|
| P(A-Poco)*P(B-Poco) | 0,027 | La probabilidad de que ambos evaluadores digan "Poco" al azar. | |
| P(A-Medio)*P(B-Medio) | 0,019 | La probabilidad de que ambos evaluadores digan "Medio" al azar. | |
| P(A-Mucho)*P(B-Mucho) | 0,001 | La probabilidad de que ambos evaluadores digan "Mucho" al azar. | |
| Pr(a) | 0,890 | Pr(a) = (95+17+15+3) / (95+17+15+3+4+4+2+2+4) | Pr(a) el acuerdo relativo observado entre examinadores, o el porcentaje de acuerdo observado. |
| Pr(e) | 0,497 | Pr(e) = 0.451 + 0.027 + 0.019 + 0.001 | Pr(e) es la probabilidad de que el acuerdo entre examinadores se deba al azar, o la probabilidad hipotética de acuerdo casual. |
| Kappa | 0,782 | kappa = (Pr(a) - Pr(e)) / (1 - Pr(e)) | El coeficiente kappa de Cohen (κ) es una estadística que mide el acuerdo inter-evaluadores para los ítems cualitativos (categóricos). |

$$Exactitud = \frac{1}{n} \sum_{i=1}^{N} f_{ii}$$

| | | **Clase Predicha** | | | |
|---|---|---|---|---|---|
| | | **Clase 1** | **Clase 2** | **Clase ...** | **Clase N** |
| **Clase Real** | **Clase 1** | $f_{11}$ | $f_{12}$ | ... | $f_{1N}$ |
| | **Clase 2** | $f_{21}$ | $f_{22}$ | ... | $f_{2N}$ |
| | **Clase ...** | ... | ... | ... | ... |
| | **Clase N** | $f_{N1}$ | $f_{N2}$ | ... | $f_{NN}$ |

$$Precisión_i = \frac{f_{ii}}{\sum_{j=1}^{N} f_{ji}}$$

$$Sensibilidad_i = \frac{f_{ii}}{\sum_{j=1}^{N} f_{ij}}$$

$$Medida\_F_1(i) = \frac{2 * Sensibilidad_i * Precision_i}{\left(Sensibilidad_i + Precision_i\right)}$$

$$\kappa = \frac{Pr(a) - Pr(e)}{1 - Pr(e)} \quad (9)$$

$$Pr(a) = \frac{1}{n} \sum_{i=1}^{N} f_{ii} \quad (10)$$

$$Pr(e) = \sum_{k=1}^{N} \left[ \frac{1}{n^2} \left( \sum_{i=1}^{N} f_{ik} * \sum_{j=1}^{N} f_{kj} \right) \right] \quad (11)$$

Otra forma de interpretar los resultado se el siguiente:

< 0 Acuerdo deficiente

0.01 - 0.20 Acuerdo leve

0.21 - 0.40 Acuerdo justo

0.41 - 0.60 Acuerdo moderado

0.61 - 0.80 Acuerdo sustancial

0.81 - 1.00 Acuerdo casi perfecto