UNIVERSIDAD AUTONOMA DE NUEVO LEON

FACULTAD DE CIENCIAS FISICO MATEMATICAS

MINERÍA DE DATOS

Grupo 003

“Ejercicios 1”

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EJERCICIO REGRESIÓN LINEAL

Tomando los datos de la siguiente tabla sobre los pesos y alturas de una población de 30 personas, crea una gráfica en donde el valor x represente la altura y el valor y represente el peso. Después traza una línea que se apague lo más posible a los datos que graficaste.

Peso	Altura	Peso	Altura	Peso	Altura
68.78	162	67.19	183	67.89	162
74.11	212	65.80	163	68.14	192
71.73	220	64.30	163	69.08	184
69.88	206	67.97	172	72.80	206
67.25	152	72.18	194	67.42	175
68.78	183	65.27	168	68.49	154
68.34	167	66.09	161	68.61	187
67.01	175	67.51	164	74.03	212
63.45	156	70.10	188	71.52	195
71.19	186	68.25	187	69.18	205

EJERCICIO1

In [5]:
```
x =[68.78,74.11,71.73,69.88,67.25,68.78,68.34,67.01,63.45,71.19,67.19,65.80,64.30,67.97,72.18,65.27,66.09,67.51,70.1,68.25,67.89,68.14,6
9.08,72.80,67.42,68.49,68.61,74.03,71.52,68.18]
y=[162,212,220,206,152,183,167,175,156,186,183,163,163,172,194,168,161,164,188,187,162,192,184,206,175,154,187,212,195,205]
```

In [6]:
```
import numpy as np
import matplotlib.pyplot as plt
```

NUMERODEITEMS

In [7]:
```
n = len(x)
n
```

Out[7]:
```
30
```

VARIABLES – >VECTORES

In [8]:
```
x=np.array(x)
y=np.array(y)
x
```

Out[8]:
```
array([68.78, 74.11, 71.73, 69.88, 67.25, 68.78, 68.34, 67.01, 63.45,
       71.19, 67.19, 65.8 , 64.3 , 67.97, 72.18, 65.27, 66.09, 67.51,
       70.1 , 68.25, 67.89, 68.14, 69.08, 72.8 , 67.42, 68.49, 68.61,
       74.03, 71.52, 68.18])
```

CALCULODEDATOS

In [9]:
```
sumx = sum(x)
sumy = sum(y)
sumx2 = sum(x**2)
sumy2 = sum(y**2)
sumxy = sum(x*y)

promx = sumx/n
promy = sumy/n

sumy
```

Out[9]: 5434

CALCULOECUACIONDELMODELOLINEAL

In [10]:
```
m = (sumx*sumy-n*sumxy)/(sumx**2-n*sumx2)
b = promy-m*promx

m,b
```

Out[10]: (5.691413018082044, -209.9312436897747)

y=-209.931x+5.6914

CALCULOR2AJD

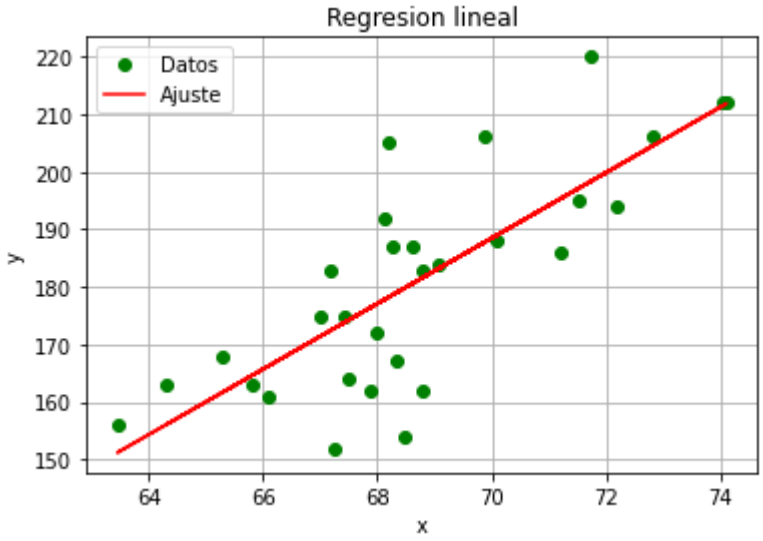
In [11]:
```
sigmax = np.sqrt(sumx2/n-promx**2)
sigmay = np.sqrt(sumy2/n-promy**2)
sigmaxy = sumxy/n-promx*promy

R2=(sigmaxy/(sigmax/sigmay))**2
R2
```

Out[11]: 76867.31498850457

GRAFICO

In [12]:
```
plt.plot(x,y,'o',label='Datos',color='green')
plt.plot(x,m*x+b,label='Ajuste',color='red')
plt.xlabel('x')
plt.ylabel('y')
plt.title('Regresion lineal')
plt.grid()
plt.legend()
plt.show()
```


Regresion lineal
Datos
Ajuste
220
210
200
190
180
170
160
150
y
64
66
68
70
72
74
x

EJERCICIO 2

Observa la tabla que se describe a continuación. Utilizando el algoritmo a priori, y la técnica de asociación, realiza la tabla de relaciones y resuelve cuál es el nivel K de soporte más alto al que podemos llegar con estos datos teniendo un umbral de 0.5.

ID	Transacciones
1	A B C E
2	B E
3	C D E
4	A C D
5	A C E

EJERCICIO2

In [3]:
```
def Load_data():

    transacciones = (["A", "B", "C", "E"],["B", "E"],["C", "D", "E"],["A", "C", "D"],["A", "C", "E"],)

    return transacciones
```

In [5]:
```
def createC1 (data):
    C1 = []
    for transaction in data:
        for item in transaction:
            if not [item] in C1:
                C1.append([item])
    C1.sort()

    return [ set (x) for x in C1]
```

In [6]:
```
def createCk(Lk, k):
    cand_list = []
    len_Lk = len(Lk)

    for i in range(len_Lk):
        for j in range(i+1, len_Lk):
            L1 = list(Lk[i])[:k-2]
            L2 = list(Lk[j])[:k-2]
            L1.sort()
            L2.sort()
            if L1==L2:
                cand_list.append(Lk[i] | Lk[j])
    return cand_list
```

In [7]:
```
def createCk(Lk, k):
    cand_list = []
    len_Lk = len(Lk)

    for i in range(len_Lk):
        for j in range(i+1, len_Lk):
            L1 = list(Lk[i])[:k-2]
            L2 = list(Lk[j])[:k-2]
            L1.sort()
            L2.sort()
            if L1==L2:
                cand_list.append(Lk[i] | Lk[j])
    return cand_list
```

In [8]:
```
min_support = 0.5
```

In [9]:
```
data = Load_data()
data
```

Out[9]:
```
(['A', 'B', 'C', 'E'],
 ['B', 'E'],
 ['C', 'D', 'E'],
 ['A', 'C', 'D'],
 ['A', 'C', 'E'])
```

In [11]:
```
C1 = createC1(data)
C1
```

Out[11]:
```
[{'A'}, {'B'}, {'C'}, {'D'}, {'E'}]
```

In [12]:
```
D = list(map(set, data))
D
```

Out[12]:
```
[{'A', 'B', 'C', 'E'},
 {'B', 'E'},
 {'C', 'D', 'E'},
 {'A', 'C', 'D'},
 {'A', 'C', 'E'}]
```

In [13]:
```
L1, support_data1 = scanD(D, C1, min_support)
```

In [14]:
```
L1
```

Out[14]:
```
[frozenset({'E'}), frozenset({'C'}), frozenset({'A'})]
```

In [15]:
```
support_data1
```

Out[15]:
```
{frozenset({'A'}): 0.6,
 frozenset({'B'}): 0.4,
 frozenset({'C'}): 0.8,
 frozenset({'E'}): 0.8,
 frozenset({'D'}): 0.4}
```

k = 2

In [16]:
```
C2 = createCk(L1, k=2)
C2
```

Out[16]:
```
[frozenset({'C', 'E'}), frozenset({'A', 'E'}), frozenset({'A', 'C'})]
```

In [17]:
```
L2, support_data2 = scanD(D, C2, min_support)
```

In [18]:
```
L2
```

Out[18]:
```
[frozenset({'A', 'C'}), frozenset({'C', 'E'})]
```

In [19]:
```
support_data2
```

Out[19]:
```
{frozenset({'C', 'E'}): 0.6,
 frozenset({'A', 'E'}): 0.4,
 frozenset({'A', 'C'}): 0.6}
```

k = 3

In [20]:
```
C3 = createCk(L2, k=3)
C3
```

Out[20]:
```
[]
```

In [21]:
```
L3, support_data3 = scanD(D, C3, min_support)
```

In [22]:
```
L3
```

Out[22]:
```
[]
```

In [23]:
```
support_data3
```

Out[23]:
```
{}
```

In [ ]:
```

```