```
import pandas as pd
import statsmodels.api as sm
import matplotlib.pyplot as plt
import seaborn as sns

sns.set(style='whitegrid')
```

Carga de Datos

```
csv_path = r"C:\Users\Juan Diego\Downloads\propiedades_limpias.csv"
df = pd.read_csv(csv_path)

print("Primeras filas del DataFrame original:")
df.head()
```

```
Primeras filas del DataFrame original:
```

```
        id  camaras                    area  precio  habitaciones banos
tamano  \
0  2821389       34                      15  1850.0             3   3.5
341
1  2816041       11  Santa Catarina Pinula   950.0             2   1.5
119
2  2810458       45                      14  2100.0             2     2
290
3  2806268       45                      14  1800.0             2     2
125
4  2801852        9                      16  3800.0             3   3.5
339

   parqueos
0         2
1         2
2         2
3         2
4         4
```

Conversión y Limpieza de Datos

```
cols_to_convert = ['habitaciones', 'banos', 'parqueos', 'tamano',
'precio']
for col in cols_to_convert:
    df[col] = pd.to_numeric(df[col], errors='coerce')

# Remover valores nulos
```

```
df.dropna(subset=cols_to_convert, inplace=True)
```

Aplicación de Filtros

```
precio_maximo = 100000
tamano_maximo = 600
parqueos_maximo = 6

df_filtrado = df[(df['precio'] <= precio_maximo) &
                 (df['tamano'] <= tamano_maximo) &
                 (df['parqueos'] <= parqueos_maximo)]

print(f"Propiedades después de filtros: {len(df_filtrado)} filas")
df_filtrado.head()
```

```
Propiedades después de filtros: 351 filas
```

	id	camaras	area	precio	habitaciones	banos	tamano	parqueos
0	2821389	34	15	1850.0	3	3.5	341.0	2
1	2816041	11	Santa Catarina Pinula	950.0	2	1.5	119.0	2
2	2810458	45	14	2100.0	2	2.0	290.0	2
3	2806268	45	14	1800.0	2	2.0	125.0	2
4	2801852	9	16	3800.0	3	3.5	339.0	4

Función de Regresión Lineal Simple

```
def simple_linear_regression(df, independent_var,
dependent_var='precio'):
    df_temp = df[[independent_var, dependent_var]].dropna()

    X = sm.add_constant(df_temp[independent_var])
    y = df_temp[dependent_var]
```

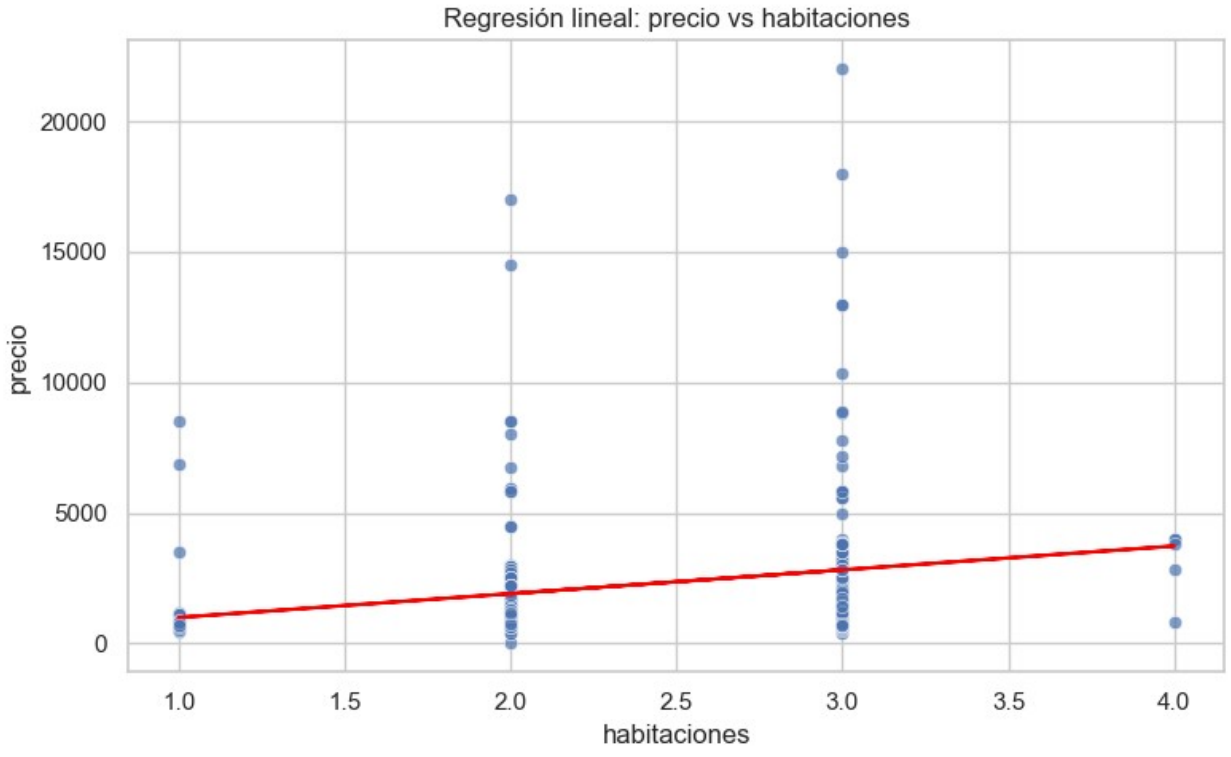
```
    model = sm.OLS(y, X).fit()
    print(model.summary())

    plt.figure(figsize=(8,5))
    sns.scatterplot(x=df_temp[independent_var], y=y, alpha=0.7)
    plt.plot(df_temp[independent_var], model.predict(X), color='red')
    plt.ticklabel_format(style='plain', axis='y')
    plt.xlabel(independent_var)
    plt.ylabel(dependent_var)
    plt.title(f'Regresión lineal: {dependent_var} vs
{independent_var}')
    plt.grid(True)
    plt.tight_layout()
    plt.show()

    return model
```

Regresión para cada Variable

```
# Regresión para 'habitaciones'
model_habitaciones = simple_linear_regression(df_filtrado,
'habitaciones')
```

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                 precio   R-squared:
0.065
Model:                            OLS   Adj. R-squared:
0.063
Method:                 Least Squares   F-statistic:
24.45
Date:                Wed, 05 Mar 2025   Prob (F-statistic):
1.19e-06
Time:                        15:48:06   Log-Likelihood:
-3247.4
No. Observations:                 351   AIC:
6499.
Df Residuals:                     349   BIC:
6507.
Df Model:                           1

Covariance Type:            nonrobust
==============================================================================
==========
```

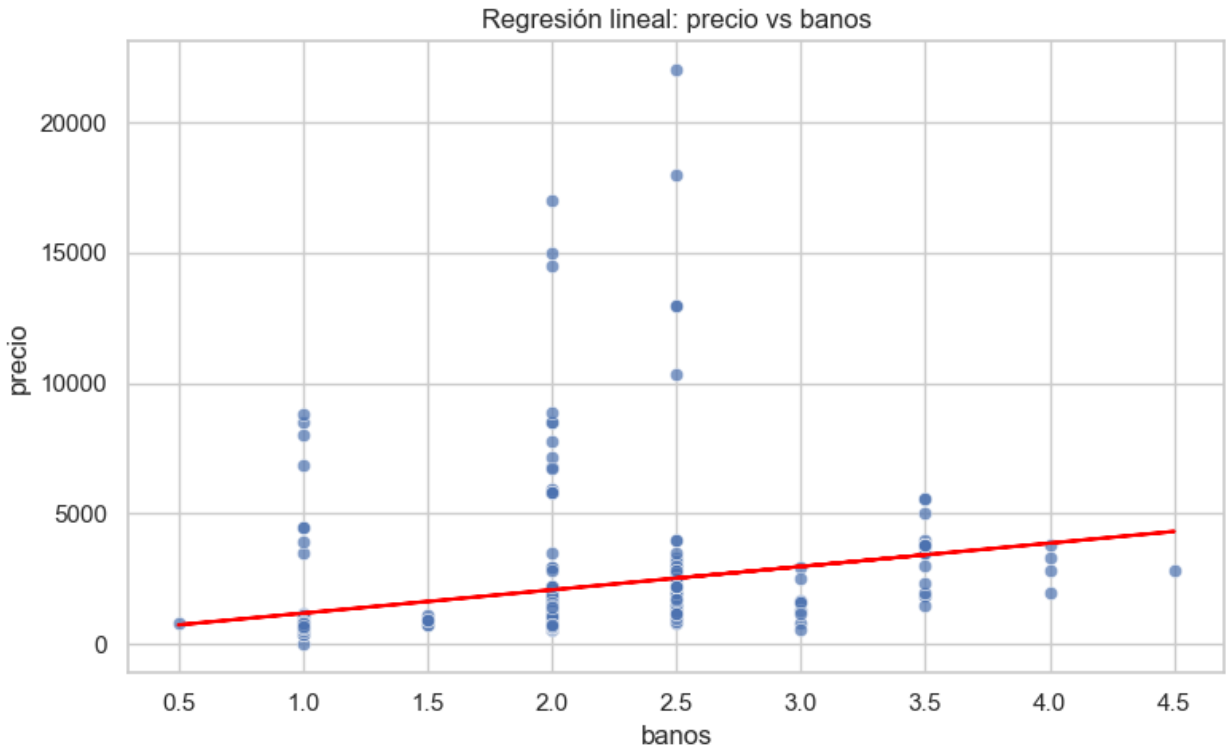
```
                    coef    std err          t      P>|t|      [0.025
0.975]
------------------------------------------------------------------------------
----------
const            73.9314    424.464      0.174      0.862    -760.899
908.761
habitaciones    913.0086    184.639      4.945      0.000     549.864
1276.153
==============================================================================
========
Omnibus:                      324.579   Durbin-Watson:
1.475
Prob(Omnibus):                  0.000   Jarque-Bera (JB):
6881.338
Skew:                           3.994   Prob(JB):
0.00
Kurtosis:                      23.167   Cond. No.
8.48
==============================================================================
========

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is
correctly specified.
```



```python
# Regresión para 'banos'
model_banos = simple_linear_regression(df_filtrado, 'banos')
```

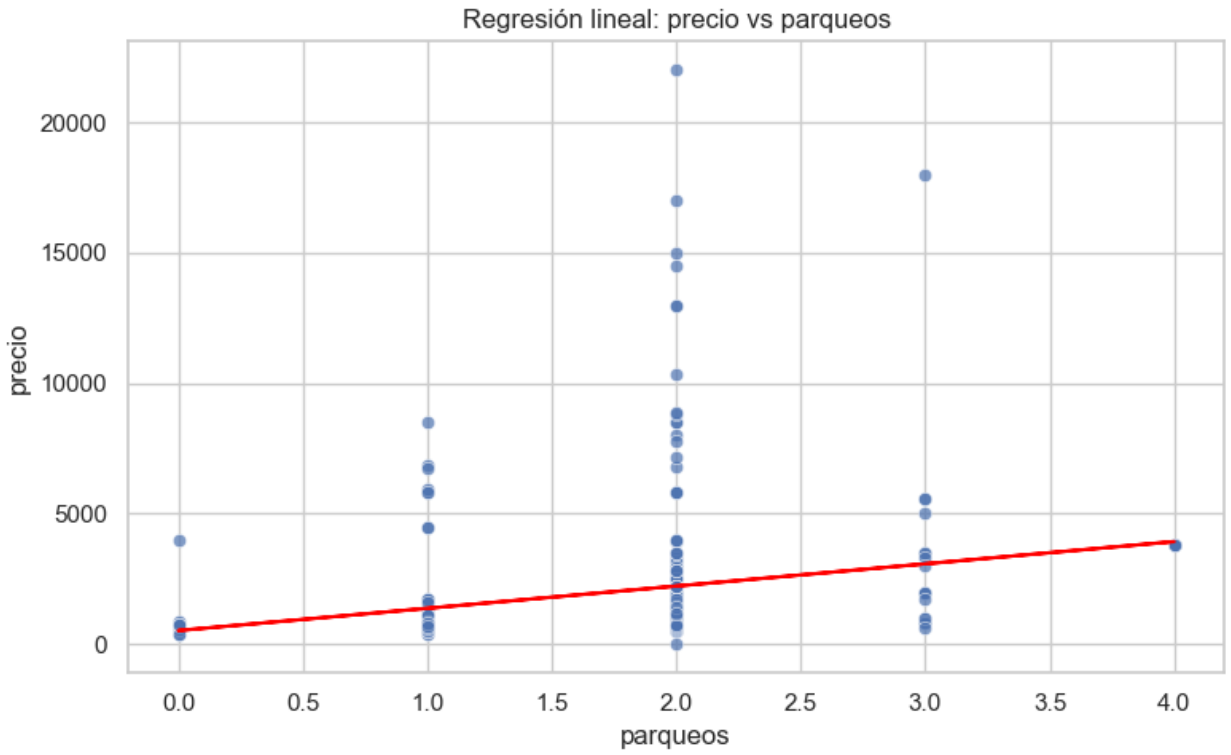
```
                            OLS Regression Results
==============================================================================
Dep. Variable:                 precio   R-squared:                       0.060
Model:                            OLS   Adj. R-squared:                  0.058
Method:                 Least Squares   F-statistic:                     22.46
Date:                Wed, 05 Mar 2025   Prob (F-statistic):           3.12e-06
Time:                        15:48:06   Log-Likelihood:                -3248.3
No. Observations:                 351   AIC:                             6501.
Df Residuals:                     349   BIC:                             6508.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const        293.8340    397.236      0.740      0.460    -487.444    1075.112
banos        895.1956    188.880      4.739      0.000     523.709    1266.682
==============================================================================
Omnibus:                      338.897   Durbin-Watson:                   1.409
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             7715.757
Skew:                           4.246   Prob(JB):                         0.00
Kurtosis:                      24.341   Cond. No.                         7.43
==============================================================================

Notes:
```

```
[1] Standard Errors assume that the covariance matrix of the errors is
correctly specified.
```




```
# Regresión para 'parqueos'
model_parqueos = simple_linear_regression(df_filtrado, 'parqueos')

                            OLS Regression Results

==============================================================================
Dep. Variable:                 precio   R-squared:
0.049
Model:                            OLS   Adj. R-squared:
0.047
Method:                 Least Squares   F-statistic:
18.17
Date:                Wed, 05 Mar 2025   Prob (F-statistic):
2.60e-05
Time:                        15:48:07   Log-Likelihood:
-3250.4
No. Observations:                 351   AIC:
6505.
Df Residuals:                     349   BIC:
6512.
```

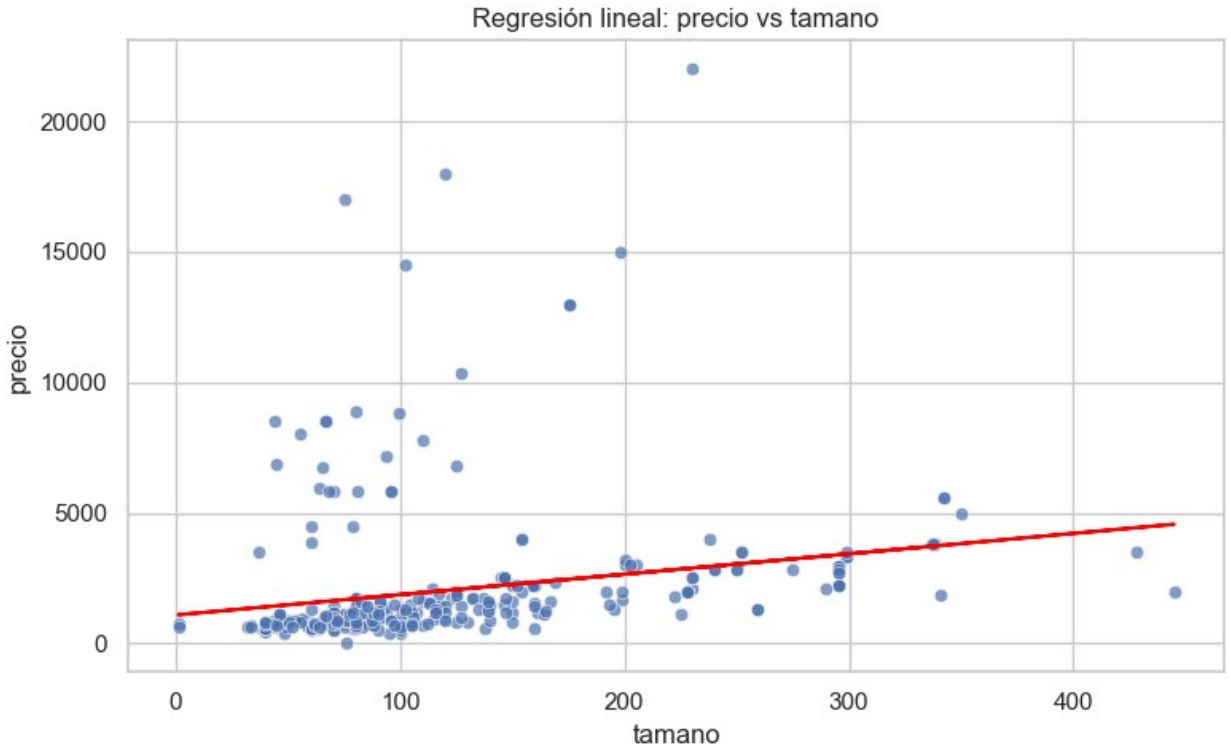
```
Df Model:                           1

Covariance Type:            nonrobust

==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const        524.4052    385.937      1.359      0.175    -234.649    1283.460
parqueos     852.2638    199.924      4.263      0.000     459.055    1245.472
==============================================================================
Omnibus:                      331.515   Durbin-Watson:                   1.424
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             7234.107
Skew:                           4.118   Prob(JB):                         0.00
Kurtosis:                      23.659   Cond. No.                         6.79
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```




```
# Regresión para 'tamano'
model_tamano = simple_linear_regression(df_filtrado, 'tamano')
```

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                 precio   R-squared:
0.061
Model:                            OLS   Adj. R-squared:
0.059
Method:                 Least Squares   F-statistic:
22.83
Date:                Wed, 05 Mar 2025   Prob (F-statistic):
2.61e-06
Time:                        15:48:08   Log-Likelihood:
-3248.2
No. Observations:                 351   AIC:
6500.
Df Residuals:                     349   BIC:
6508.
Df Model:                           1

Covariance Type:            nonrobust
```

```
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const       1083.2369    245.814      4.407      0.000     599.775    1566.699
tamano         7.8172      1.636      4.778      0.000       4.600      11.035
==============================================================================
Omnibus:                      343.118   Durbin-Watson:                   1.413
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             7918.432
Skew:                           4.327   Prob(JB):                         0.00
Kurtosis:                      24.600   Cond. No.                         273.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```



💾 Guardar Resultados

```
df_filtrado.to_csv("propiedades_filtradas.csv", index=False)
print("Archivo guardado exitosamente como
'propiedades_filtradas.csv'")
```

```
Archivo guardado exitosamente como 'propiedades_filtradas.csv'
```