

```
In [ ]: %pip install pandas  
        %pip install nbconvert
```

Requirement already satisfied: pandas in /usr/local/lib/python3.10/dist-packages (2.1.4)

Requirement already satisfied: numpy<2,>=1.22.4 in /usr/local/lib/python3.10/dist-packages (from pandas) (1.26.4)

Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.10/dist-packages (from pandas) (2.8.2)

Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas) (2024.1)

Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (from pandas) (2024.1)

Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)

Requirement already satisfied: nbconvert in /usr/local/lib/python3.10/dist-packages (6.5.4)

Requirement already satisfied: lxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.9.4)

Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.12.3)

Requirement already satisfied: bleach in /usr/local/lib/python3.10/dist-packages (from nbconvert) (6.1.0)

Requirement already satisfied: defusedxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.7.1)

Requirement already satisfied: entrypoints>=0.2.2 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.4)

Requirement already satisfied: Jinja2>=3.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (3.1.4)

Requirement already satisfied: jupyter-core>=4.7 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.7.2)

Requirement already satisfied: jupyterlab-pygments in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.3.0)

Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (2.1.5)

Requirement already satisfied: mistune<2,>=0.8.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.8.4)

Requirement already satisfied: nbclient>=0.5.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.10.0)

Requirement already satisfied: nbformat>=5.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.10.4)

Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from nbconvert) (24.1)

Requirement already satisfied: pandocfilters>=1.4.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (1.5.1)

Requirement already satisfied: pygments>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (2.16.1)

Requirement already satisfied: tinycss2 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (1.3.0)

Requirement already satisfied: traitlets>=5.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.7.1)

Requirement already satisfied: platformdirs>=2.5 in /usr/local/lib/python3.10/dist-packages (from jupyter-core>=4.7->nbconvert) (4.2.2)

Requirement already satisfied: jupyter-client>=6.1.12 in /usr/local/lib/python3.10/dist-packages (from nbclient>=0.5.0->nbconvert) (6.1.12)

Requirement already satisfied: fastjsonschema>=2.15 in /usr/local/lib/python3.10/dist-packages (from nbformat>=5.1->nbconvert) (2.20.0)

Requirement already satisfied: jsonschema>=2.6 in /usr/local/lib/python3.10/dist-packages (from nbformat>=5.1->nbconvert) (4.23.0)

Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.10/dist-packages (from beautifulsoup4->nbconvert) (2.6)

Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.10/dist-packages (from bleach->nbconvert) (1.16.0)

Requirement already satisfied: webencodings in /usr/local/lib/python3.10/dist-packages (from bleach->nbconvert) (0.5.1)
 Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>=5.1->nbconvert) (24.2.0)
 Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>=5.1->nbconvert) (2023.12.1)
 Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>=5.1->nbconvert) (0.35.1)
 Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>=5.1->nbconvert) (0.20.0)
 Requirement already satisfied: pyzmq>=13 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.12->nbclient>=0.5.0->nbconvert) (24.0.1)
 Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.12->nbclient>=0.5.0->nbconvert) (2.8.2)
 Requirement already satisfied: tornado>=4.1 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.12->nbclient>=0.5.0->nbconvert) (6.3.3)

```
In [ ]: import pandas as pd
import math
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.linear_model import SGDRegressor
from sklearn.metrics import mean_squared_error

oCelsiusValhalla = pd.read_csv('/content/Valhalla23.csv')
```

```
In [ ]: # Dividir los datos en conjuntos de entrenamiento y prueba
train_x, test_x, train_y, test_y = train_test_split(oCelsiusValhalla[["Celsius"]], oCelsiusValhalla["Fahrenheit"],
                                                    test_size=0.2, random_state=42)

# Crear el modelo de regresión lineal
model = SGDRegressor(eta0=0.0001, max_iter=100)

model.fit(train_x, train_y)

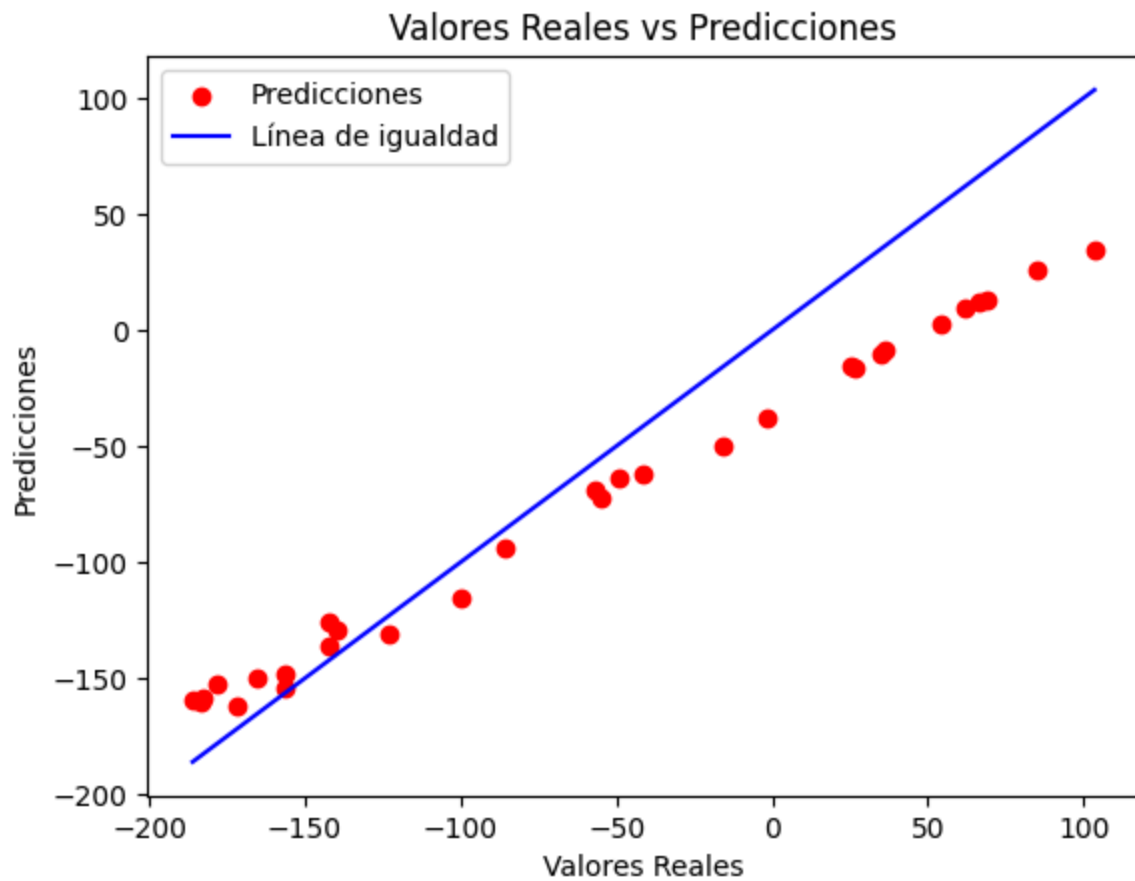
y_pred = model.predict(test_x)

mse = mean_squared_error(test_y, y_pred)
print("Mean Squared Error: ", mse)

plt.scatter(test_y, y_pred, color='red', label='Predicciones')
plt.plot([test_y.min(), test_y.max()], [test_y.min(), test_y.max()], color='blue', label='Valores Reales')
plt.xlabel('Valores Reales')
plt.ylabel('Predicciones')
plt.title('Valores Reales vs Predicciones')
plt.legend()
plt.show()
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/linear_model/_stochastic_gradient.py:
1561: ConvergenceWarning: Maximum number of iteration reached before convergence. Consider increasing max_iter to improve the fit.
```

```
warnings.warn(
Mean Squared Error: 1150.2603813049934
```



Los hiperparametros de $\alpha = 0.00001$ y $\text{max_iter} = 100$, los use a prueba y error donde vi que el valor de `mean_squared_error` daba un valor mas pequeño de otras opciones que use