In [1]:
```
%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-pac
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Requirement already satisfied: nbconvert in /usr/local/lib/python3.10/dist-packages
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(from bleach->nbconvert) (1.16.0)

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-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-package
s (from jupyter-client>=6.1.12->nbclient>=0.5.0->nbconvert) (6.3.3)
```

In [10]:
```python
import pandas as pd
import math
import matplotlib.pyplot as plt

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

test = oCelsiusValhalla.sample(frac=0.3, axis=0)
oCelsiusValhalla = oCelsiusValhalla.drop(index=test.index)


# Crear lista con los hiper-parámetros iniciales (thetas)
iN = len(oCelsiusValhalla)
fTeta0 = 5
fTeta1 = 1
# Cargar el valor del learning rate (alpha)
fAlpha = 0.0005
fValorBuscado = 61.47200 # -139.7400

oCelsiusValhalla.index = range(len(oCelsiusValhalla))
#print(oCelsiusValhalla)
#print(oCelsiusValhalla.to_string())
```

In [26]:
```python
fTeta0 = -5
fTeta1 = 1
iContador = 0

while iContador < 1000:

  # Crear función lambda para la función de hipótesis
  oH0Lambda = lambda teta0, teta1, x: teta0 + (teta1 * x)
  # Calcular el total de muestras a partir de los datos (n)
  oH0 = []
  iH0Total = 0
  for x in oCelsiusValhalla["Celsius"]: oH0.append( oH0Lambda(fTeta0, fTeta1, x) )
  iH0Total = sum(oH0)


  # Calcular delta para theta0 y para cada muestra
  oDelta = []
  iDeltaTotal = 0
  i = 0
```

```python
    while(i < iN):
      oDelta.append( oH0[i] - oCelsiusValhalla["Valks"][i]  )
      i += 1
    iDeltaTotal = sum(oDelta)


    # Calcular delta para theta1 y para cada muestra

    oDeltaX = []
    iDeltaXTotal = 0
    i = 0
    while(i < iN):
      oDeltaX.append( oDelta[i] * oCelsiusValhalla["Celsius"][i]  )
      i += 1

    iDeltaXTotal = sum(oDeltaX)


    # Actualizar theta0
    fTeta0 = fTeta0 - (fAlpha * ((1/iN) * iDeltaTotal) )

    # Actualizar theta1
    fTeta1 = fTeta1 - (fAlpha * ((1/iN) * iDeltaXTotal) )

    iContador += 1
#fYm = 0
#fYm = fTeta0 + fTeta1 * fValorBuscado
#print("Estimacion Ym: " + str(fYm))
```

```python
In [27]: oYPrediccion = []
         for y in test["Valks"]:
           fYm = 0
           fYm = fTeta0 + fTeta1 * y
           oYPrediccion.append(fYm)
         fig, ax1 = plt.subplots()

         #print("Original: ", test["Valks"], " Prediccion", oYPrediccion)

         ax2 = ax1.twinx()
         ax1.plot(test["Celsius"], test["Valks"], 'o', color="g")
         ax2.plot(test["Celsius"], oYPrediccion, 'o', color="b")

         ax1.set_xlabel('Celsisus')
         ax1.set_ylabel('Valks Original', color='g')
         ax2.set_ylabel('Valks Prediccion', color='b')

         plt.show()
```
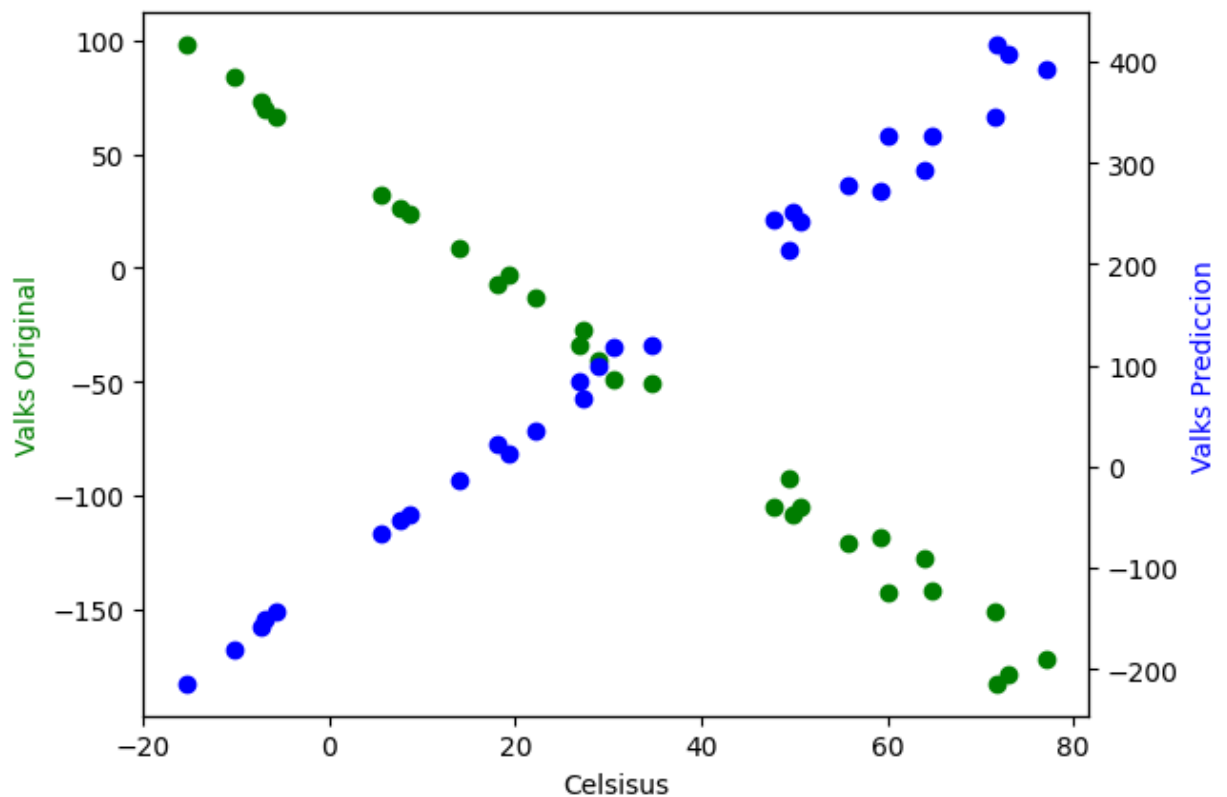
```
In [ ]:   from google.colab import files
          f = files.upload()

          # Convert ipynb to html
          import subprocess
          file0 = list(f.keys())[0]
          _ = subprocess.run(["pip", "install", "nbconvert"])
          _ = subprocess.run(["jupyter", "nbconvert", file0, "--to", "html"])

          # download the html
          files.download(file0[:-5]+"html")
```

Choose Files No file chosen   Upload widget is only available when the cell has been
executed in the current browser session. Please rerun this cell to enable.
 Saving Challenge_A00835194.ipynb to Challenge_A00835194.ipynb