

**Correlación parcial**

Se el primero en calificar

**Indice de contenidos**[[mostrar](https://mlstudio.jaol.net/correlacion-parcial/)]

¿Qué es la correlación parcial y su propósito?

La correlación parcial se utiliza para encontrar la correlación entre dos variables (típicamente una variable dependiente y una independiente) con el efecto de otras variables influyentes controladas.

Por ejemplo, si hay tres variables ‘A’, ‘B’, ‘Z’, si desea encontrar la relación entre ‘A’ y ‘B’ con la influencia de ‘Z’ controlada, puede utilizar la correlación parcial.

Es útil en varias situaciones del mundo real y puede enriquecer los resultados de su EDA con información más valiosa.

**Relacionado** : [Curso](https://mlstudio.jaol.net/s/store/courses/description/data-pre-processing-and-eda) completo[de preprocesamiento de datos y EDA](https://mlstudio.jaol.net/s/store/courses/description/data-pre-processing-and-eda) de Selva (científico principal de datos)

Diferencia entre correlación simple y correlación parcial

La correlación simple (también conocida como coeficiente de correlación de Pearson) puede no brindar una imagen completa al tratar de comprender la relación entre dos variables (A y B), especialmente cuando existen otras variables que influyen que afectan A (y / o) B.

De hecho, la correlación simple se centra principalmente en encontrar la influencia de cada variable sobre la otra.

Mientras que la correlación\_parcial se usa para encontrar la relación refinada entre dos variables con el efecto de las otras variables influyentes que se excluyen / controlan.

Veamos algunos ejemplos en los que puede utilizar la correlación parcial.

Ejemplo de correlación parcial en el mundo real

1) **Educación** : Si tiene tres variables **horas de estudio** , **notas obtenidas** , **clases asistidas** y desea encontrar la correlación entre las **clases asistidas** y las **notas obtenidas** controlando los efectos de las **horas** de **estudio** . La correlación parcial será relevante aquí porque las ‘horas de estudio’ también pueden depender de las clases a las que asista (y las calificaciones) y es posible que desee ver la relación pura entre estos dos, excluyendo el efecto de las horas de estudio.

2) **Detección del tiempo** : si tiene tres variables de **partículas de aerosol** y **abundancia de nubes** y **velocidad del viento** . Puede utilizar la correlación parcial para encontrar la relación entre la **cantidad de aerosol** y la **abundancia de nubes** .

3) **Detección de peso** : las variables pueden ser **cantidad de comida** , **aumento de peso** , **calorías** . Esta técnica se puede utilizar para encontrar la relación entre la **cantidad de comida** , **el aumento de peso** y la variable que se controla son las **calorías** .

Fórmula de correlación parcial

Interfaz de usuario gráfica, Texto, Aplicación

Descripción generada automáticamente

Crear el conjunto de datos y la visualización

# Create a sample dataset

import pandas as pd

import matplotlib.pyplot as plt

import math

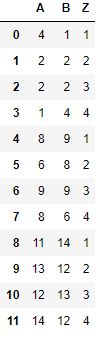
Data = {'A' : [4, 2, 2, 1, 8, 6, 9, 8, 11, 13, 12, 14],

'B' : [1, 2, 2, 4, 9, 8, 9, 6, 14, 12, 13, 12],

'Z' : [1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4]}

df = pd.DataFrame(Data, columns = ['A', 'B', 'Z'])

df



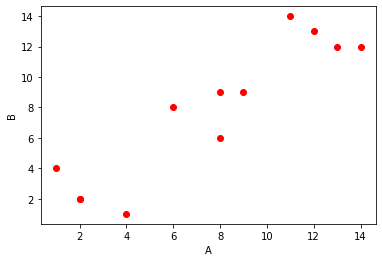
Creemos un diagrama de dispersión de las variables ‘A’ y ‘B’

# Scatterplot to understand the relationship

plt.plot(df["A"],df["B"],'ro')

plt.xlabel("A")

plt.ylabel("B")

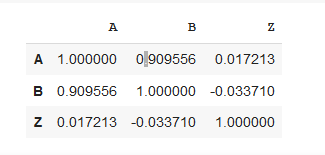


Claramente, a medida que aumenta ‘A’, también aumenta ‘B’.

Calculemos primero la correlación de Pearson antes de calcular la correlación parcial.

# Calcular la correlación de pearson

df.corr (). corr ()



Cálculo de correlación parcial

El pingouintiene una función llamada para calcular el partial\_correlation..partial\_corr

#!pip install pingouin

import pingouin as pg

pg.partial\_corr(data=df, x='A', y='B', covar='Z')

# Where,

# Data = Name of the dataframe.

# x = Name of column in dataframe.

# y = Name of column in dataframe.

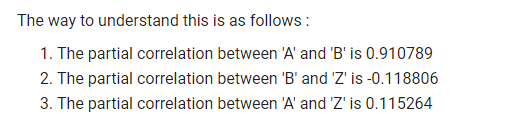
# z = variable to be excluded/controlled.

Cálculo de correlación parcial

El valor de correlación parcial que obtenemos después de excluir ‘Z’ es 0.910789 que corresponde a una fuerte correlación positiva. Para calcular la correlación\_parcial entre múltiples variables se utiliza la función..pcorr()

df.pcorr().round(7)

![Tabla

Descripción generada automáticamente](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAYABgAAD/4RDoRXhpZgAATU0AKgAAAAgABAE7AAIAAAAKAAAISodpAAQAAAABAAAIVJydAAEAAAAUAAAQzOocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFdpbmRvdyAxMAAABZADAAIAAAAUAAAQopAEAAIAAAAUAAAQtpKRAAIAAAADMTMAAJKSAAIAAAADMTMAAOocAAcAAAgMAAAIlgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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En este caso, la correlación parcial resulta ser mayor que la correlación de Pearson. Este puede ser el caso cuando la tercera variable tiene una relación de correlación negativa con una de las variables.

De lo contrario, por lo general, la correlación parcial es menor que la correlación de Pearson.

Limitaciones de la correlación parcial

Algunas limitaciones del análisis de correlación\_parcial son:

1. El cálculo de la correlación\_parcial depende totalmente del coeficiente de correlación simple. El coeficiente de correlación simple asume que las relaciones están en forma lineal. Pero en el mundo real, los fenómenos de relaciones lineales son bastante raros.
2. Cuando el orden del coeficiente de correlación\_parcial aumenta, su confiabilidad disminuye.
3. Sus cálculos son bastante difíciles de encontrar el valor de ‘r’ puede ser bastante difícil y llevar mucho tiempo. Pero las cosas son bastante fáciles porque hay muchos softwares y bibliotecas disponibles para realizar este trabajo.
4. A medida que aumenta el número de variables de control, el cálculo de la correlación\_parcial se volverá más complicado.