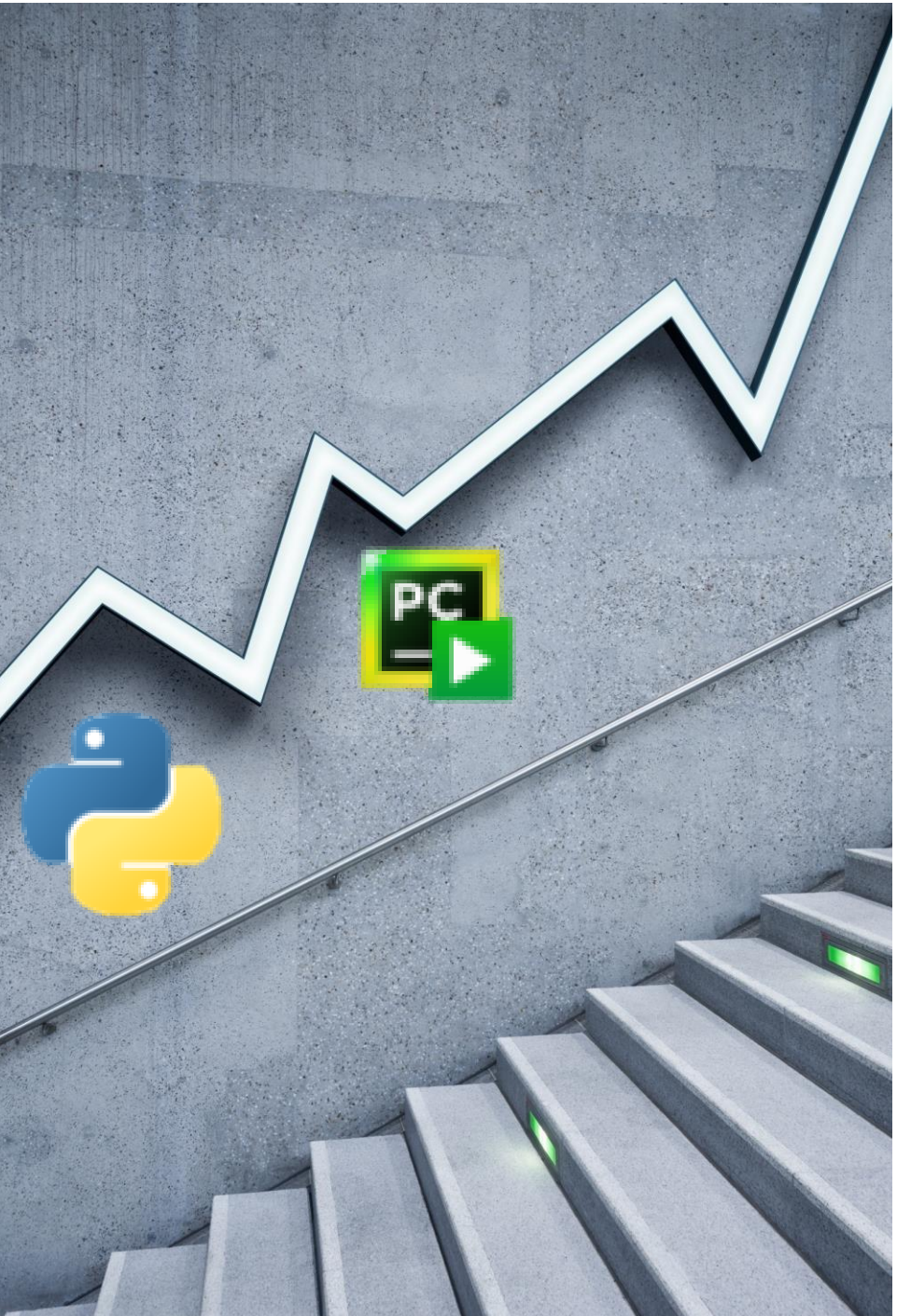

# INITIATION IN "PYTHON" LANGUAGE

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# Initiation in python

## What you have to know (Basic):

- Documentation and comments
- Variables and Data Types
- Input and output
- Using Modules and Libraries
- Mathematical operations
- Flow Control (Loops and conditional structures)
- Functions
- List

# Try …

- Ask the user for his year of birth and calculate his current age.
- Write a program that asks the user for a number and displays whether it's odd or even (Nombre pair ou impair).

# Initiation in python – Basic Game

**Game 1 : Rock-Paper-Scissors Game**

Create an interactive game where the user plays against the computer in the classic Rock-Paper-Scissors. The program will display the result of each round.

**Key Steps :**

- Prompt the user to choose between rock, paper, or scissors.
- Use a function to have the computer randomly select one of the same options.
- Establish rules to determine the winner based on the choices of the user and the computer.
- Allow the user to play multiple rounds, displaying the result of each round and asking if they want to continue.
- Include a mechanism to handle invalid entries by the user.

**Libraries to Use**

**random** : To generate the computer's random choice.

# Initiation in python – Basic Game

**Game 2 : Mystery Number Game**

Create a guessing game where the user attempts to guess a randomly generated number between 1 and 250. The program will provide hints and track the time taken to guess correctly.

**Key Steps**

- Use a random number generator to select a number between 1 and 250.
- Ask the user to enter their guess.
- Compare the user's guess to the generated number and provide hints (too high, too low).
- Count the number of attempts the user makes until they guess correctly.
- Use a timer to measure the duration from the start of the game until the correct guess.

**Libraries to Use**

**random**: To generate the random number.

**time**: To track the duration taken by the user to guess the number.

# Initiation in python – Basic Exercise

- Exercise 1: Print the sum of the current number and the previous number
- Exercise 2: Print characters from a string.
- Exercise 3: Remove first 5 characters from a string
- Exercise 4: Remove last 5 characters from a string
- Exercise 5: Remove first or last n characters from a string

# Initiation in python – Basic Exercise

- Exercise 6: Write a function to solve 2nd order equation
- Exercise 7: Ask a number and displays its multiplication table (from 1 to 10)
- Exercise 8: Ask the user to enter a string and display it in reverse
- Exercise 9: Ask for a password of 4 digits. Try until the password is not all positive value and 4 digits. Show the final password
- Exercise 10: Generate and display a list of squares of numbers from 1 to 10

# Pandas and DataFrame : Basics

Exercise 1: Create a DataFrame with the following data:

- Columns: "Name", "Age", "City"
- Rows: ("Maxwell", 27, "Kumasi"), ("Zossin", 24, "Abomey") and ("Nafi", 23, "Ouaga")

Exercise 2: Display the first 2 rows

Exercise 3: Calculate and print the average age of the people in the DataFrame

Exercise 4: Filter the DataFrame to show only the rows where the country is "Ghana"

Exercise 5: Add a new column "Salary" to the DataFrame with arbitrary values, and display the updated DataFrame

Exercise 6: Rename the column “Gender" to " M/F" in the DataFrame and display the updated DataFrame

Exercise 7: Group the DataFrame by “Gender" and count the number of occurrences for each city.

Exercise 8: Sort the DataFrame by the "Age" column in descending order and display the result

# Pandas and DataFrame

| Country | GDP (Billion $) | Education Spending (% of GDP) | Unemployment Rate (%) | Life Expectancy (years) |
|---|---|---|---|---|
| CountryA | 1500 | 5 | 4.5 | 78 |
| CountryB | 3000 | 6 | 3.2 | 82 |
| CountryC | 2000 | 4 | 5.1 | 75 |
| CountryD | 4000 | 3 | 6.0 | 80 |
| CountryE | 2500 | 7 | 2.8 | 85 |

## GDP and Education

Exercise 1: Calculate the amount spent on education for each country in billion dollars. Display the results as a DataFrame.

Exercise 2: Identify the country with the lowest unemployment rate. Display the country and the unemployment rate.

Exercise 3: Calculate the average life expectancy for all countries. Display the result.

Exercise 4: Calculate the correlation between GDP and education spending. Interpret the result.

Exercise 5: Suppose each country's GDP increases by 3% per year for 4 years. Calculate and display the projected GDP for each country after 4 years.

# Pandas and DataFrame

| Country | Solar Energy Capacity (GW) | Solar Energy Production (TWh) | Population (millions) | Solar Percentage (%) |
|---|---|---|---|---|
| CountryA | 50 | 70 | 60 | 15 |
| CountryB | 120 | 180 | 100 | 25 |
| CountryC | 30 | 40 | 30 | 10 |
| CountryD | 200 | 300 | 200 | 30 |
| CountryE | 80 | 120 | 80 | 20 |

**SOLAR ENERGY**

Exercise 1: Calculate the solar energy production per capita for each country (in MWh). Display the results as a DataFrame.

Exercise 2: Identify the country with the highest solar energy capacity per capita. Display the country and the capacity per capita.

Exercise 3: Calculate the ratio of solar energy production to installed capacity for each country. Display the results.

Exercise 4: Calculate the correlation between solar energy capacity and solar energy production. Interpret the result.

Exercise 5: Suppose each country increases its solar energy capacity by 10% per year for 5 years. Calculate and display the projected capacity for each country after 5 years.

# Pandas and DataFrame

| Country | Energy Consumption (TWh) | Energy Efficiency Rating (1-10) | Industry Energy Use (%) | Residential Energy Use (%) |
|---|---|---|---|---|
| CountryA | 600 | 8 | 40 | 30 |
| CountryB | 2500 | 6 | 50 | 25 |
| CountryC | 1200 | 7 | 35 | 20 |
| CountryD | 4000 | 5 | 55 | 35 |
| CountryE | 1800 | 9 | 45 | 40 |

## ENERGY EFFICIENCY

Exercise 1: Calculate the total energy efficiency for each country (in TWh) by multiplying energy consumption by the efficiency rating. Display the results as a DataFrame.

Exercise 2: Identify the country with the lowest energy consumption per efficiency point. Display the country and the consumption per point.

Exercise 3: Calculate the share of energy consumption used by the residential and industrial sector for each country. Display the results.

Exercise 4: Calculate the correlation between energy efficiency rating and the share of energy consumption in the industrial sector. Interpret the result.

# Pandas and DataFrame

| Country | Energy Consumption (TWh) | Renewable Energy (%) | $CO_2$ Emissions (Mt) | Population (millions) |
|---|---|---|---|---|
| CountryA | 450 | 30 | 50 | 67 |
| CountryB | 4000 | 20 | 500 | 331 |
| CountryC | 600 | 40 | 80 | 83 |
| CountryD | 6500 | 25 | 900 | 1439 |
| CountryE | 1200 | 15 | 200 | 1380 |

**ENERGY and $CO_2$ EMISSION**

Exercise 1: Calculate the energy consumption per capita for each country. Display the results as a DataFrame.

Exercise 2: Identify the country with the highest CO2 emissions per capita. Display the country and the amount of emissions per capita.

Exercise 3: Calculate the total renewable energy consumption for each country and display the results.

Exercise 4: Calculate the correlation between total energy consumption and CO2 emissions. Interpret the result.

Exercise 5: Suppose each country increases its energy consumption by 5% per year for 5 years. Calculate and display the projected energy consumption for each country after 5 years.

# Pandas Basic Exercise (20 min)

Exercise 1: Basic DataFrame Operations with Pandas

You have a small dataset containing information about different fruits. You will perform basic operations to manipulate the data.

| Fruit | Quantity | Price per Unit ($) |
|---|---|---|
| Apple | 30 | 0.5 |
| Banana | 20 | 0.25 |
| Orange | 25 | 0.75 |
| Grape | 15 | 1.0 |
| Pineapple | 10 | 1.5 |

Tasks :

1. Import the necessary libraries
2. Create a DataFrame from the dataset
3. Display the first few rows of the DataFrame
4. Calculate the total price for each fruit and add it as a new column.
5. Filter the DataFrame to show only fruits with a total price greater than $10.

# Matplotlib and Pandas : Simple Plotting with Matplotlib

You will use the data from Exercise 1 to create a bar chart showing the total price for each fruit.

Tasks :

1. Import Matplotlib.
2. Create a bar chart representing the total price of each fruit.
3. Add titles and labels to the chart.
4. Display the chart

# Combining Pandas and Matplotlib

You will analyze a small dataset of sales data and visualize the total sales over a few months.

Tasks :

1. Import the necessary libraries.
2. Create a DataFrame from the dataset.
3. Calculate the cumulative sales and add it as a new column.
4. Create a line plot for the cumulative sales over the months.
5. Add titles and labels to the plot.
6. Display the plot.

| Month | Sales ($) |
|---|---|
| January | 1200 |
| February | 1500 |
| March | 1700 |
| April | 2000 |
| May | 2500 |
| June | 2700 |
| July | 2900 |
| August | 3200 |
| September | 3570 |
| October | 3750 |
| November | 3800 |
| December | 4000 |

# Problem on Matplotlib

| Country | Year | Energy Consumption (TWh) | CO2 Emission (Million tons) | Population (Millions) |
|---|---|---|---|---|
| CountryA | 2020 | 500 | 300 | 50 |
| CountryA | 2021 | 550 | 320 | 51 |
| CountryA | 2022 | 600 | 340 | 52 |
| CountryB | 2020 | 700 | 400 | 70 |
| CountryB | 2021 | 750 | 420 | 71 |
| CountryB | 2022 | 800 | 450 | 72 |
| CountryC | 2020 | 300 | 150 | 30 |
| CountryC | 2021 | 350 | 160 | 31 |
| CountryC | 2022 | 400 | 170 | 32 |
| CountryD | 2020 | 400 | 250 | 40 |
| CountryD | 2021 | 450 | 260 | 41 |
| CountryD | 2022 | 500 | 270 | 42 |
| CountryD | 2020 | 600 | 350 | 60 |
| CountryD | 2021 | 650 | 370 | 61 |
| CountryD | 2022 | 700 | 390 | 62 |

## Energy Consumption and $CO_2$ Emissions

You are analyzing the relationship between energy consumption and CO2 emissions for different countries over a period of time.

# Problem on Matplotlib

| Country | Year | Energy Consumption (TWh) | CO2 Emission (Million tons) | Population (Millions) |
|---|---|---|---|---|
| CountryA | 2020 | 500 | 300 | 50 |
| CountryA | 2021 | 550 | 320 | 51 |
| CountryA | 2022 | 600 | 340 | 52 |
| CountryB | 2020 | 700 | 400 | 70 |
| CountryB | 2021 | 750 | 420 | 71 |
| CountryB | 2022 | 800 | 450 | 72 |
| CountryC | 2020 | 300 | 150 | 30 |
| CountryC | 2021 | 350 | 160 | 31 |
| CountryC | 2022 | 400 | 170 | 32 |
| CountryD | 2020 | 400 | 250 | 40 |
| CountryD | 2021 | 450 | 260 | 41 |
| CountryD | 2022 | 500 | 270 | 42 |
| CountryD | 2020 | 600 | 350 | 60 |
| CountryD | 2021 | 650 | 370 | 61 |
| CountryD | 2022 | 700 | 390 | 62 |

## Energy Consumption and $CO_2$ Emissions

Task :

1.Import the data into a Pandas DataFrame.

2.Calculate the CO2 emissions per capita (tons per person) for each country and year.

# Problem on Matplotlib

| Country | Year | Energy Consumption (TWh) | CO2 Emission (Million tons) | Population (Millions) |
|---|---|---|---|---|
| CountryA | 2020 | 500 | 300 | 50 |
| CountryA | 2021 | 550 | 320 | 51 |
| CountryA | 2022 | 600 | 340 | 52 |
| CountryB | 2020 | 700 | 400 | 70 |
| CountryB | 2021 | 750 | 420 | 71 |
| CountryB | 2022 | 800 | 450 | 72 |
| … | … | … | … | … |

## Energy Consumption and $CO_2$ Emissions

3. Create a line plot showing the trend of CO2 emissions for each country over the three year.

4. Identify the country with the highest CO2 emissions per capita in 2022 and display the country and the value.

5. Calculate the total energy consumption for each country over the three years and display the results.

6. Create a bar chart comparing the total CO2 emissions for each country in 2022

7. Determine the average CO2 emissions per capita for each country across the three years.

# Meteorological Data Analysis and Processing

The goal of this study is to explore relationships between solar radiation and other meteorological variables.

The data looks like, … →

(44135 rows × 38 columns)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | Temp | Hi | Low | Out | Dew | Wind | Wind | Wind | Hi | Hi | Wind | Heat | THW | THSW | Press | Pluie | Rain |
| 2 | Date | Time | Out | Temp | Temp | Hum | Pt, | Speed | Dir | Run | Speed | Dir | Chill | Index | Index | Index | Bar | Rain | Rate |
| 3 | 01/01/2018 | 0:01 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 4 | 01/01/2018 | 0:02 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 5 | 01/01/2018 | 0:03 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 6 | 01/01/2018 | 0:04 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 7 | 01/01/2018 | 0:05 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 8 | 01/01/2018 | 0:06 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 9 | 01/01/2018 | 0:07 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 10 | 01/01/2018 | 0:08 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 1.8 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 11 | 01/01/2018 | 0:09 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 12 | 01/01/2018 | 0:10 | 24.5 | 24.6 | 24.5 | 78 | 20.4 | 0.900 | S | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 13 | 01/01/2018 | 0:11 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 14 | 01/01/2018 | 0:12 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 15 | 01/01/2018 | 0:13 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 16 | 01/01/2018 | 0:14 | 24.5 | 24.5 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 17 | 01/01/2018 | 0:15 | 24.4 | 24.5 | 24.4 | 78 | 20.4 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 18 | 01/01/2018 | 0:16 | 24.4 | 24.4 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 19 | 01/01/2018 | 0:17 | 24.4 | 24.4 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 20 | 01/01/2018 | 0:18 | 24.4 | 24.4 | 24.4 | 79 | 20.6 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.4 | 26 | 26 | 25.2 | 1013.9 | 0 | |
| 21 | 01/01/2018 | 0:19 | 24.4 | 24.4 | 24.4 | 79 | 20.6 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.4 | 26 | 26 | 25.2 | 1013.9 | 0 | |
| 22 | 01/01/2018 | 0:20 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 23 | 01/01/2018 | 0:21 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 24 | 01/01/2018 | 0:22 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 25 | 01/01/2018 | 0:23 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 26 | 01/01/2018 | 0:24 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 27 | 01/01/2018 | 0:25 | 24.4 | 24.4 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 28 | 01/01/2018 | 0:26 | 24.3 | 24.4 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.3 | 25.8 | 25.8 | 25 | 1013.8 | 0 | |
| 29 | 01/01/2018 | 0:27 | 24.3 | 24.3 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.3 | 25.8 | 25.8 | 25 | 1013.8 | 0 | |
| 30 | 01/01/2018 | 0:28 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 31 | 01/01/2018 | 0:29 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 32 | 01/01/2018 | 0:30 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 33 | 01/01/2018 | 0:31 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |

JANVIER 2018 | Feuil1

Task :

1.Import the necessary libraries.

2.Import the file and read a few lines

3.Display the columns and their types

4.Extract the columns necessary for the study

5.Rename the column names as you want

# Meteorological Data Analysis and Processing

The goal of this study is to explore relationships between solar radiation and other meteorological variables.

The data looks like, … →

↓

(44135 rows × 38 columns)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | Temp | Hi | Low | Out | Dew | Wind | Wind | Wind | Hi | Hi | Wind | Heat | THW | THSW | Press | Pluie | Rain |
| 2 | Date | Time | Out | Temp | Temp | Hum | Pt, | Speed | Dir | Run | Speed | Dir | Chill | Index | Index | Index | Bar | Rain | Rate |
| 3 | 01/01/2018 | 0:01 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 4 | 01/01/2018 | 0:02 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 5 | 01/01/2018 | 0:03 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 6 | 01/01/2018 | 0:04 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 7 | 01/01/2018 | 0:05 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.3 | 1014.1 | 0 | |
| 8 | 01/01/2018 | 0:06 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 9 | 01/01/2018 | 0:07 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 10 | 01/01/2018 | 0:08 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.400 | SSE | 0.03 | 1.8 | SSE | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 11 | 01/01/2018 | 0:09 | 24.6 | 24.6 | 24.6 | 78 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.6 | 26.1 | 26.1 | 25.2 | 1014 | 0 | |
| 12 | 01/01/2018 | 0:10 | 24.5 | 24.6 | 24.5 | 78 | 20.4 | 0.900 | S | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 13 | 01/01/2018 | 0:11 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 14 | 01/01/2018 | 0:12 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 15 | 01/01/2018 | 0:13 | 24.5 | 24.5 | 24.5 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 16 | 01/01/2018 | 0:14 | 24.5 | 24.5 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.5 | 26 | 26 | 25.2 | 1014 | 0 | |
| 17 | 01/01/2018 | 0:15 | 24.4 | 24.5 | 24.4 | 78 | 20.4 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 18 | 01/01/2018 | 0:16 | 24.4 | 24.4 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 19 | 01/01/2018 | 0:17 | 24.4 | 24.4 | 24.4 | 78 | 20.4 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 20 | 01/01/2018 | 0:18 | 24.4 | 24.4 | 24.4 | 79 | 20.6 | 0.900 | SSE | 0.05 | 1.8 | SSE | 24.4 | 26 | 26 | 25.2 | 1013.9 | 0 | |
| 21 | 01/01/2018 | 0:19 | 24.4 | 24.4 | 24.4 | 79 | 20.6 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.4 | 26 | 26 | 25.2 | 1013.9 | 0 | |
| 22 | 01/01/2018 | 0:20 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 23 | 01/01/2018 | 0:21 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 24 | 01/01/2018 | 0:22 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.400 | S | 0.03 | 0.9 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 25 | 01/01/2018 | 0:23 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 26 | 01/01/2018 | 0:24 | 24.4 | 24.4 | 24.4 | 79 | 20.5 | 0.900 | S | 0.05 | 1.8 | S | 24.4 | 25.9 | 25.9 | 25.1 | 1013.9 | 0 | |
| 27 | 01/01/2018 | 0:25 | 24.4 | 24.4 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.4 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 28 | 01/01/2018 | 0:26 | 24.3 | 24.4 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.3 | 25.8 | 25.8 | 25 | 1013.8 | 0 | |
| 29 | 01/01/2018 | 0:27 | 24.3 | 24.3 | 24.3 | 79 | 20.5 | 0.900 | SSE | 0.05 | 1.3 | SSE | 24.3 | 25.8 | 25.8 | 25 | 1013.8 | 0 | |
| 30 | 01/01/2018 | 0:28 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 31 | 01/01/2018 | 0:29 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 32 | 01/01/2018 | 0:30 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.400 | SSE | 0.03 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |
| 33 | 01/01/2018 | 0:31 | 24.3 | 24.3 | 24.3 | 80 | 20.7 | 0.900 | SSE | 0.05 | 0.9 | SSE | 24.3 | 25.9 | 25.9 | 25.1 | 1013.8 | 0 | |

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Task (Contd):

6. Extract the period between 8:00 AM and 5:00 PM (8h00 and 17h00)

7. Remove missing data

8. Calculate the correlation between solar radiation and other variables

9. Keep only the variables with a correlation greater than 0.3

10. Plot graphs of correlated variables (scatter plot) to visualize the relationships between solar radiation and the remaining variables.

# BONUS : ANDROID APP CREATION USING APP INVENTOR (no code!)