Working with Data in Python Cheat Sheet

Reading and writing files

```
Package/Method Description
                               Syntax: r (reading) w (writing) a (appending) + (updating: read/write) b (binary, otherwise text)
                  Different
                  modes to
File opening
                  open files
modes
                                 1. Examples: with open("data.txt", "r") as file: content = file.read() print(content) with open("output.txt", "w") as file:
                  for specific
                  operations.
                               Copied!
                               Syntax:
                                 1. 1
                                 2. 2
3. 3
                                 1. file.readlines() # reads all lines as a list
                                 2. readline() # reads the next line as a string
                                 3. file.read() # reads the entire file content as a string
                  Different
                                Copied!
                  methods to
File reading
                  read file
                               Example:
methods
                  content in
                  various
                                  1. 1
                  ways.
                                 2. 2
                                 3. 3
                                 4. 4
                                  1. with open("data.txt", "r") as file:
                                  2.
                                         lines = file.readlines()
                                         next_line = file.readline()
content = file.read()
                                 3.
                                 4.
                               Copied!
                               Syntax:
                                 1. 1

    file.write(content) # writes a string to the file

                                 2. file.writelines(lines) # writes a list of strings to the file
                  Different
                                Copied!
                  write
                  methods to
File writing
                               Example:
methods
                  write
                  content to a
                                  1. 1
                  file.
                                  2. 2
                                 1. lines = ["Hello\n", "World\n"]
2. with open("output.txt", "w") as file:
                                         file.writelines(lines)
                               Copied!
                               Syntax:
                                 1. 1
                                 1. for line in file: # Code to process each line
                  Iterates
                               Copied!
                  through
Iterating over
                  each line in
                               Example:
                  the file
lines
                  using a
                  'loop'.
                                 1. with open("data.txt", "r") as file:
                                 2. for line in file: print(line)
                               Copied!
Open() and
                  Opens a
                               Syntax:
close()
                  file,
                                 1. 1
                  performs
                                 2. 2
                  operations,
                  and
                                 1. file = open(filename, mode) # Code that uses the file
                                 2. file.close()
                  explicitly
                  closes the
                               Copied!
                  file using
                  the close()
                               Example:
                  method.
                                 2. 2
3. 3
                                 1. file = open("data.txt", "r")
```

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2. content = file.read()
                                   3. file.close()
                                Copied!
                                Syntax:
                                  1. 1
                                  1. with open(filename, mode) as file: # Code that uses the file
                   Opens a file
                   using a with Copied!
                  block,
with open()
                   ensuring
                                Example:
                   automatic
                   file closure
                                   2. 2
                  after usage.

    with open("data.txt", "r") as file:
    content = file.read()

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Pandas
Package/Method
                                         Description
                                                                                                             Syntax and Code Example
                                                                            Syntax: dataframe name = pd.read csv("filename.csv") Example: df =
.read_csv()
                   Reads data from a `.CSV` file and creates a DataFrame.
                                                                            pd.read_csv("data.csv")
                                                                            Syntax:
                                                                               1. 1
                                                                               1. dataframe_name = pd.read_excel("filename.xlsx")
                                                                            Copied!
                  Reads data from an Excel file and creates a DataFrame
.read\_excel()
                                                                            Example:
                                                                               1. 1
                                                                               1. df = pd.read_excel("data.xlsx")
                                                                            Copied!
                                                                            Syntax:
                                                                               1. 1
                                                                               1. dataframe_name.to_csv("output.csv", index=False)
                                                                            Copied!
.to_csv()
                   Writes DataFrame to a CSV file.
                                                                            Example:
                                                                               1. 1

    df.to_csv("output.csv", index=False)

                                                                            Copied!
                                                                            Syntax:
                                                                               1. 1
                                                                               2. 2
                                                                               1. dataframe_name["column_name"] # Accesses single column
2. dataframe_name[["column1", "column2"]] # Accesses multiple columns
                                                                            Copied!
Access Columns Accesses a specific column using [] in the DataFrame.
                                                                            Example:
                                                                               2. 2

    df["age"]
    df[["name", "age"]]

                                                                            Copied!
                                                                            Syntax:
                                                                               1. 1

    dataframe_name.describe()

                                                                             Copied!
                   Generates statistics summary of numeric columns in the
describe()
                   DataFrame.
                                                                            Example:
                                                                               1. 1

    df.describe()

                                                                             Copied!
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Syntax:
                                                                                     1. 1
                                                                                     2. 2
                                                                                     1. dataframe_name.drop(["column1", "column2"], axis=1, inplace=True)
2. dataframe_name.drop(index=[row1, row2], axis=0, inplace=True)
                                                                                   Copied!
                    Removes specified rows or columns from the
                    DataFrame. axis=1 indicates columns. axis=0 indicates
drop()
                                                                                  Example:
                    rows.
                                                                                     1. 1
                                                                                     2. 2
                                                                                     1. df.drop(["age", "salary"], axis=1, inplace=True) # Will drop columns
2. df.drop(index=[5, 10], axis=0, inplace=True) # Will drop rows
                                                                                  Copied!
                                                                                  Syntax:
                                                                                     1. 1

    dataframe_name.dropna(axis=0, inplace=True)

                                                                                  Copied!
                    Removes rows with missing NaN values from the
dropna()
                    DataFrame. axis=0 indicates rows.
                                                                                  Example:
                                                                                     1. 1

    df.dropna(axis=0, inplace=True)

                                                                                   Copied!
                                                                                  Syntax:
                                                                                     1. 1

    dataframe_name.duplicated()

                                                                                  Copied!
                    Duplicate or repetitive values or records within a data
duplicated()
                    set.
                                                                                  Example:
                                                                                     1. 1
                                                                                     1. duplicate_rows = df[df.duplicated()]
                                                                                  Copied!
                                                                                  Syntax:
                                                                                     1. 1
                                                                                     1. filtered_df = dataframe_name[(Conditional_statements)]
                                                                                   Copied!
                    Creates a new DataFrame with rows that meet specified
Filter Rows
                    conditions.
                                                                                  Example:
                                                                                     1. 1
                                                                                     1. filtered_df = df[(df["age"] > 30) & (df["salary"] < 50000)</pre>
                                                                                  Copied!
                                                                                  Syntax:
                                                                                     1. 1

    grouped = dataframe_name.groupby(by, axis=0, level=None, as_index=True,
    sort=True, group_keys=True, squeeze=False, observed=False, dropna=True)

                    Splits a DataFrame into groups based on specified
                                                                                  Copied!
groupby()
                    criteria, enabling subsequent aggregation,
                    transformation, or analysis within each group.
                                                                                  Example:
                                                                                     1. 1
                                                                                     1. grouped = df.groupby(["category", "region"]).agg({"sales": "sum"})
                                                                                   Copied!
head()
                    Displays the first n rows of the DataFrame.
                                                                                  Syntax:
                                                                                     1. 1

    dataframe name.head(n)

                                                                                  Copied!
                                                                                  Example:
                                                                                     1. 1
```

```
1. df.head(5)
                                                                       Copied!
                                                                      Syntax:
                                                                        1. 1
                                                                         1. import pandas as pd
                                                                      Copied!
Import pandas
                 Imports the Pandas library with the alias pd.
                                                                      Example:
                                                                         1. 1
                                                                         1. import pandas as pd
                                                                      Copied!
                                                                      Syntax:
                                                                         1. 1
                                                                         1. dataframe_name.info()
                                                                      Copied!
                 Provides information about the DataFrame, including
info()
                 data types and memory usage.
                                                                      Example:
                                                                         1. 1
                                                                         1. df.info()
                                                                      Copied!
                                                                      Syntax:
                                                                         1. merged_df = pd.merge(df1, df2, on=["column1", "column2"])
                                                                      Copied!
                 Merges two DataFrames based on multiple common
merge()
                 columns.
                                                                      Example:
                                                                         1. merged_df = pd.merge(sales, products, on=["product_id", "category_id"])
                                                                       Copied!
                                                                      Syntax:
                                                                         1. 1

    print(df) # or just type df

                                                                      Copied!
print DataFrame Displays the content of the DataFrame.
                                                                      Example:
                                                                        1. 1
2. 2

    print(df)
    df

                                                                      Copied!
                                                                      Syntax:
                                                                         1. dataframe_name["column_name"].replace(old_value, new_value, inplace=True)
                                                                      Copied!
                 Replaces specific values in a column with new values.
replace()
                                                                      Example:
                                                                         1. 1

    df["status"].replace("In Progress", "Active", inplace=True)

                                                                      Copied!
tail()
                 Displays the last n rows of the DataFrame.
                                                                      Syntax:
                                                                         1. 1
                                                                         1. dataframe_name.tail(n)
                                                                      Copied!
                                                                      Example:
                                                                         1. 1
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1. df.tail(5)

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```
Numpy
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```
Package/Method
                                           Description
                                                                                                    Syntax and Code Example
                                                                         Syntax:
                                                                            1. 1
                                                                            1. import numpy as np
                                                                         Copied!
Importing NumPy
                           Imports the NumPy library.
                                                                         Example:
                                                                            1. 1
                                                                            1. import numpy as np
                                                                         Copied!
                                                                         Syntax:
                                                                            1. 1
                                                                            1. array_1d = np.array([list1 values]) # 1D Array
2. array_2d = np.array([[list1 values], [list2 values]]) # 2D Array
np.array()
                           Creates a one or multi-dimensional array,
                                                                         Example:
                                                                            1. 1
2. 2
                                                                            1. array_1d = np.array([1, 2, 3]) # 1D Array
2. array_2d = np.array([[1, 2], [3, 4]]) # 2D Array
                                                                         Copied!
                                                                         Example:
                                                                            2. 2
3. 3
4. 4
                           - Calculates the mean of array elements
                           - Calculates the sum of array elements
                                                                            5. 5
Numpy Array Attributes - Finds the minimum value in the array

    np.mean(array)

                           - Finds the maximum value in the array

    np.sum(array)
    np.min(array)

                           - Computes dot product of two arrays
                                                                            4. np.max(array)
                                                                            5. np.dot(array_1, array_2)
                                                                         Copied!
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