Q.1 Describe the functionality of the `describe()` function and its variations.

Descriptive statistics include those that summarize the central tendency, dispersion and shape of a dataset's distribution, excluding NaN values.

Analyzes both numeric and object series, as well as DataFrame column sets of mixed data types. The output will vary depending on what is provided.

DataFrame.describe(percentiles=None, include=None, exclude=None)

include 'all', list-like of dtypes or None (default), optional A white list of data types to include in the result. Ignored for Series. Here are the options:

'all' : All columns of the input will be included in the output.

A list-like of dtypes : Limits the results to the provided data types. To limit the result to numeric types submit numpy.number. To limit it instead to object columns submit the numpy.object data type. Strings can also be used in the style of select_dtypes (e.g. df.describe(include=['O'])). To select pandas categorical columns, use 'category'

None (default) : The result will include all numeric columns.

exclude list-like of dtypes or None (default), optional, A black list of data types to omit from the result. Ignored for Series. Here are the options:

A list-like of dtypes : Excludes the provided data types from the result. To exclude numeric types submit numpy.number. To exclude object columns submit the data type numpy.object. Strings can also be used in the style of select_dtypes (e.g. df.describe(exclude=['O'])). To exclude pandas categorical columns, use 'category'

None (default) : The result will exclude nothing.

Describing a DataFrame. By default only numeric fields are returned.

```
import pandas as pd
df = pd.DataFrame({'categorical': pd.Categorical(['d', 'e', 'f']),
                   'numeric': [1, 2, 3],
                   'object': ['a', 'b', 'c']
                   })
df.describe()
```

```
       numeric
count      3.0
mean       2.0
std        1.0
min        1.0
25%        1.5
```

```
50%         2.0
75%         2.5
max         3.0
```

Describing all columns of a DataFrame regardless of data type.

```
df.describe(include='all')
```

```
       categorical  numeric object
count            3      3.0      3
unique           3      NaN      3
top              d      NaN      a
freq             1      NaN      1
mean           NaN      2.0    NaN
std            NaN      1.0    NaN
min            NaN      1.0    NaN
25%            NaN      1.5    NaN
50%            NaN      2.0    NaN
75%            NaN      2.5    NaN
max            NaN      3.0    NaN
```

Including only string columns in a DataFrame description.

```
df.describe(include=[object])
```

```
       object
count       3
unique      3
top         a
freq        1
```

Q.2 Specify the maximum character limit permissible for file names and file paths in the Windows operating system. Additionally, enumerate the special characters that are prohibited in file names.

In Windows, the maximum length for a full file path, including the file name and extension, is 260 characters, and the maximum length for a file name is 255 characters

Q.3 Identify alternatives to the Itertools module in Python.

ANS:

1.functools.reduce() Function: The reduce() function applies this function to the first two elements of the iterable,then to the result and the third element, and so on, until it has processed the entire iterable.

```
import functools

def sum(a, b):
    return a + b

numbers = [1, 2, 3, 4]

result = functools.reduce(sum, numbers)
print(result)
```

```
10
```

2.List comprehensions are a powerful feature of Python that can make your code more concise and easier to read. They are often used to transform or filter data, and can be used with any iterable object, including lists, tuples, sets, and dictionaries.

```
# Creating a list of squares of the numbers from 1 to 5
squares = [x**2 for x in range(1, 6)]
print(squares)
```

```
[1, 4, 9, 16, 25]
```

3.The enumerate() function is a useful tool for iterating over a dictionary and keeping track of the index of each item. It can be used with any iterable object, including lists, tuples, sets, and dictionaries.

```
# Creating a dictionary of fruits and their prices
fruit_prices = {'apple': 0.5, 'banana': 0.25, 'cherry': 1.0, 'date':
0.75}

# Using enumerate() to iterate over the dictionary and printing the
index and value of each item
for index, (fruit, price) in enumerate(fruit_prices.items()):
    print(f'Index: {index}, Fruit: {fruit}, Price: {price}')
```

```
Index: 0, Fruit: apple, Price: 0.5
Index: 1, Fruit: banana, Price: 0.25
Index: 2, Fruit: cherry, Price: 1.0
Index: 3, Fruit: date, Price: 0.75
```

Q.4.The zip() function is a useful tool for iterating over two or more iterable objects in parallel.It can be used with any iterable object, including lists, tuples, sets, and dictionaries.

```
# Creating two lists of fruits and colors
fruits = ['apple', 'banana', 'cherry', 'date']
colors = ['red', 'yellow', 'red', 'brown']

# Using zip() to iterate over the two lists and printing the fruit and
color of each item
for fruit, color in zip(fruits, colors):
    print(f'Fruit: {fruit}, Color: {color}')
```

```
Fruit: apple, Color: red
Fruit: banana, Color: yellow
Fruit: cherry, Color: red
Fruit: date, Color: brown
```

Q.6 Develop a module and associated packages within a library, followed by installation using pip.

Ans:

step 1:PACKAGE Start by creating a directory structure for your library. For example: ├── my_package/ │ ├── **init**.py │ ├── mymodule.py │ ├── mymodule1.py └── setup.py

Step2:CODE

init.py

print("my_package")

from .mymodule import hello from .mymodule1 import goodbye

mymodule.py

def hello(): print("Hello from modul e1!"

mymodule

def goodbye(): print("Goodbye from module2!") Step3:SetupFile

setup.py

from setuptools import setup, find_packages

setup(name='my_package', version='0.1', packages=find_packages

Step4:Run the following command

pip install e .

Step 5.now use the library

import my_package

my_package.mymodule.hello()

my_package.mymodule1.goodbye()

Output:

my_package Hello from module1! Goodbye from module2!

Q.7 Instruct on the process of extracting date-time data from a DataFrame and exporting it to an Excel file using Pandas while preserving the original data type.

```
import pandas as pd
import xlsxwriter

# Createing a sample DataFrame with date-time data
data = {'date': ['2022-01-01 10:00:00', '2022-01-02 15:30:00', '2022-
01-03 08:15:00'],
        'value': [10, 20, 30]}
df = pd.DataFrame(data)
df['date'] = pd.to_datetime(df['date'])

# Exporting the DataFrame to an Excel file
writer = pd.ExcelWriter('output.xlsx', engine='xlsxwriter')
df.to_excel(writer, index=False)
workbook = writer.book
worksheet = writer.sheets['Sheet1']

# format for the date column
date_format = workbook.add_format({'num_format': 'yyyy-mm-dd
hh:mm:ss'})

# Setting the format for the date column in the Excel file
start_row = 0
start_col = df.columns.get_loc('date')
end_row = start_row + len(df)
end_col = start_col + 1
worksheet.set_column(start_col, end_col, None, date_format)

# Close the Excel writer
writer.close()

df1=pd.read_excel('output.xlsx')
```

```
df1
```

```
                  date      value
0 2022-01-01 10:00:00 1900-01-10
1 2022-01-02 15:30:00 1900-01-20
2 2022-01-03 08:15:00 1900-01-30
```

Q.8 Propose alternative methods to replace the usage of the iloc function in Python.

```
import pandas as pd

nt=pd.read_csv("Netflix_Dataset.csv")

nt.columns
```

```
Index(['Title', 'Genre', 'Tags', 'Languages', 'Country Availability',
       'Runtime', 'Director', 'Writer', 'Actors', 'View Rating', 'IMDb
Score',
       'Awards Received', 'Awards Nominated For', 'Boxoffice',
'Release Date',
       'Netflix Release Date', 'Production House', 'Netflix Link',
'Summary',
       'Series or Movie', 'IMDb Votes', 'Image'],
      dtype='object')
```

```
# Using loc[]. Get cell value by name & index
print(nt.loc[8000]['Director'])
print(nt.loc[8000][10])
```

```
Jeremy Saulnier
7.1

C:\Users\Yogesh.Dhatrak\AppData\Local\Temp\
ipykernel_14228\2940577545.py:3: FutureWarning: Series.__getitem__
treating keys as positions is deprecated. In a future version, integer
keys will always be treated as labels (consistent with DataFrame
behavior). To access a value by position, use `ser.iloc[pos]`
  print(nt.loc[8000][10])
```

```
# Using iloc[]. Get cell value by index & name
print(nt.iloc[8000]['Languages'])
print(nt.iloc[8000,19])
```

```
English
Movie
```

```
# Using DataFrame.at[]
print(nt.at[8000,'Boxoffice'])
print(nt.at[nt.index[8000],'Summary'])
```

```
$2,58,384
Bad news from the past unhinges vagabond Dwight Evans, sending him on
a mission of bloody retribution that takes him to his childhood
hometown.
```

```
# Using DataFrame.iat[]
print(nt.iat[8000,20])

# Get a cell value
print(nt["Actors"].values[8000])
```

```
67790.0
Ydaiber Orozco, Dani Santiago, Macon Blair, Ronald Sarcos
```

Q.9 Illustrate the procedure for resetting the index in Python.

```
import pandas as pd

nt=pd.read_csv("Netflix_Dataset.csv")
nt.set_index('Title', inplace=True)
nt.head(5)
```

```
                                                    Genre  \
Title
Lets Fight Ghost     Crime, Drama, Fantasy, Horror, Romance
HOW TO BUILD A GIRL                                 Comedy
The Con-Heartist                             Comedy, Romance
Gleboka woda                                          Drama
Only a Mother                                         Drama

                                                                  Tags
\
Title

Lets Fight Ghost     Comedy Programmes,Romantic TV Comedies,Horror ...

HOW TO BUILD A GIRL       Dramas,Comedies,Films Based on Books,British

The Con-Heartist     Romantic Comedies,Comedies,Romantic Films,Thai...

Gleboka woda          TV Dramas,Polish TV Shows,Social Issue TV Dramas

Only a Mother        Social Issue Dramas,Dramas,Movies Based on Boo...
```

```
                             Languages  \
Title
Lets Fight Ghost     Swedish, Spanish
HOW TO BUILD A GIRL           English
The Con-Heartist                 Thai
Gleboka woda                   Polish
Only a Mother                  Swedish

                                                  Country Availability
\
Title

Lets Fight Ghost                                                Thailand

HOW TO BUILD A GIRL                                               Canada

The Con-Heartist                                                Thailand

Gleboka woda                                                      Poland

Only a Mother        Lithuania,Poland,France,Italy,Spain,Greece,Bel...


                           Runtime         Director  \
Title
Lets Fight Ghost     < 30 minutes  Tomas Alfredson
HOW TO BUILD A GIRL      1-2 hour    Coky Giedroyc
The Con-Heartist          > 2 hrs    Mez Tharatorn
Gleboka woda         < 30 minutes              NaN
Only a Mother            1-2 hour      Alf Sjöberg

                                                                  Writer
\
Title

Lets Fight Ghost                                  John Ajvide Lindqvist

HOW TO BUILD A GIRL                                        Caitlin Moran

The Con-Heartist     Pattaranad Bhiboonsawade, Mez Tharatorn, Thods...

Gleboka woda                                                        NaN

Only a Mother                                        Ivar Lo-Johansson


                                                                  Actors
\
Title
```

```
Lets Fight Ghost     Lina Leandersson, Kåre Hedebrant, Per Ragnar, ...
HOW TO BUILD A GIRL  Cleo, Paddy Considine, Beanie Feldstein, Dónal...
The Con-Heartist     Kathaleeya McIntosh, Nadech Kugimiya, Pimchano...
Gleboka woda         Katarzyna Maciag, Piotr Nowak, Marcin Dorocins...
Only a Mother        Hugo Björne, Eva Dahlbeck, Ulf Palme, Ragnar F...

                    View Rating  IMDb Score  ...  Awards Nominated For
\
Title                                        ...
Lets Fight Ghost              R         7.9  ...                  57.0
HOW TO BUILD A GIRL           R         5.8  ...                   NaN
The Con-Heartist            NaN         7.4  ...                   NaN
Gleboka woda                NaN         7.5  ...                   4.0
Only a Mother               NaN         6.7  ...                   1.0

                      Boxoffice Release Date Netflix Release Date  \
Title
Lets Fight Ghost     $21,22,065    12-Dec-08             04-03-21
HOW TO BUILD A GIRL    $70,632     08-May-20             04-03-21
The Con-Heartist           NaN    03-Dec-20             03-03-21
Gleboka woda               NaN    14-Jun-11             03-03-21
Only a Mother              NaN    31-Oct-49             03-03-21

                                          Production House  \
Title
Lets Fight Ghost                  Canal+, Sandrew Metronome
HOW TO BUILD A GIRL  Film 4, Monumental Pictures, Lionsgate
The Con-Heartist                                       NaN
Gleboka woda                                           NaN
Only a Mother                                          NaN

                                                Netflix Link  \
Title
Lets Fight Ghost     https://www.netflix.com/watch/81415947
HOW TO BUILD A GIRL  https://www.netflix.com/watch/81041267
The Con-Heartist     https://www.netflix.com/watch/81306155
Gleboka woda         https://www.netflix.com/watch/81307527
Only a Mother        https://www.netflix.com/watch/81382068
```

```
                                                                   Summary  \
Title

Lets Fight Ghost     A med student with a supernatural gift tries t...

HOW TO BUILD A GIRL  When nerdy Johanna moves to London, things get...

The Con-Heartist     After her ex-boyfriend cons her out of a large...

Gleboka woda         A group of social welfare workers led by their...

Only a Mother        An unhappily married farm worker struggling to...


                    Series or Movie IMDb Votes  \
Title
Lets Fight Ghost             Series   205926.0
HOW TO BUILD A GIRL           Movie     2838.0
The Con-Heartist              Movie      131.0
Gleboka woda                 Series       47.0
Only a Mother                 Movie       88.0

                                                                     Image

Title

Lets Fight Ghost     https://occ-0-4708-64.1.nflxso.net/dnm/api/v6/...

HOW TO BUILD A GIRL  https://occ-0-1081-999.1.nflxso.net/dnm/api/v6...

The Con-Heartist     https://occ-0-2188-64.1.nflxso.net/dnm/api/v6/...

Gleboka woda         https://occ-0-2508-2706.1.nflxso.net/dnm/api/v...

Only a Mother        https://occ-0-2851-41.1.nflxso.net/dnm/api/v6/...


[5 rows x 21 columns]
```

```python
# reset the index of the DataFrame
nt.reset_index(inplace=True)

# print the DataFrame with the reset index
print("\nDataFrame with reset index:")
nt.head(5)
```

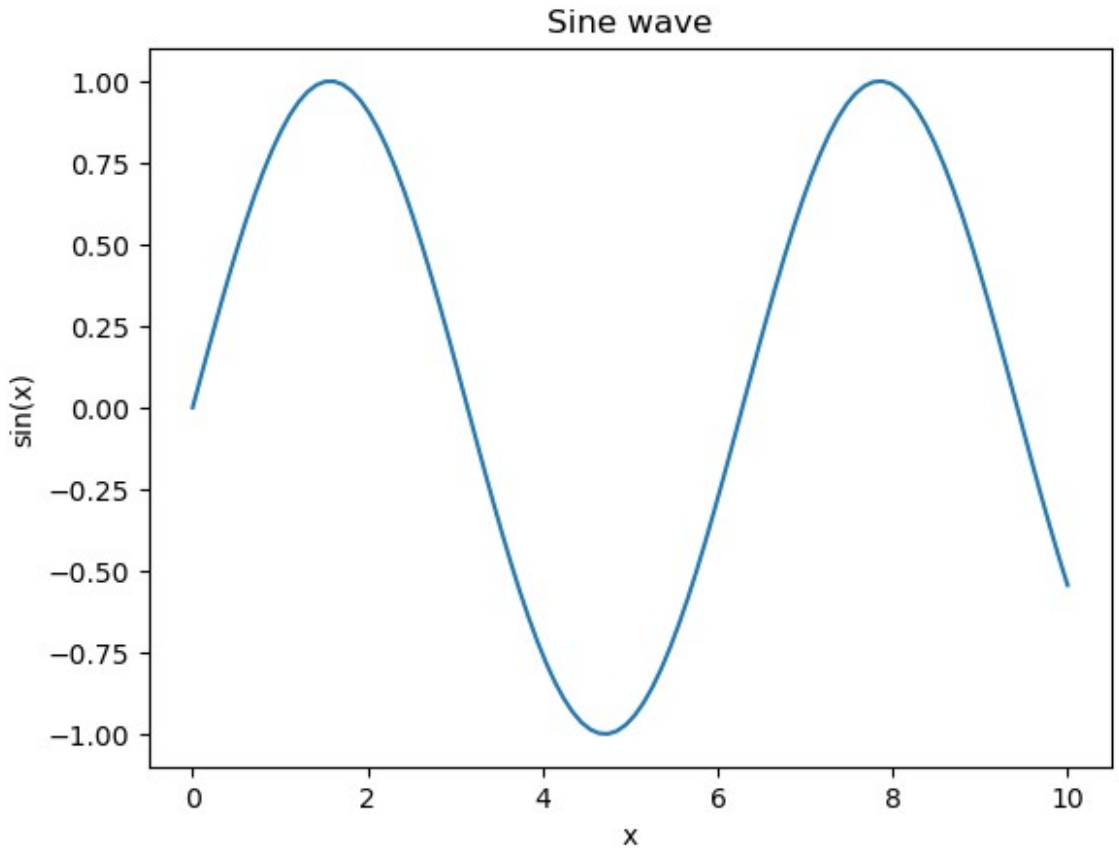
```
DataFrame with reset index:

                 Title                                   Genre  \
0     Lets Fight Ghost  Crime, Drama, Fantasy, Horror, Romance
```

```
1  HOW TO BUILD A GIRL                                        Comedy
2     The Con-Heartist                                Comedy, Romance
3         Gleboka woda                                         Drama
4        Only a Mother                                         Drama

                                                    Tags          Languages
\
0  Comedy Programmes,Romantic TV Comedies,Horror ...  Swedish, Spanish

1       Dramas,Comedies,Films Based on Books,British           English

2  Romantic Comedies,Comedies,Romantic Films,Thai...              Thai

3   TV Dramas,Polish TV Shows,Social Issue TV Dramas             Polish

4  Social Issue Dramas,Dramas,Movies Based on Boo...            Swedish


                                 Country Availability       Runtime  \
0                                             Thailand  < 30 minutes
1                                               Canada      1-2 hour
2                                             Thailand       > 2 hrs
3                                               Poland  < 30 minutes
4  Lithuania,Poland,France,Italy,Spain,Greece,Bel...      1-2 hour

          Director                                                Writer
\
0  Tomas Alfredson                                  John Ajvide Lindqvist

1    Coky Giedroyc                                          Caitlin Moran

2    Mez Tharatorn  Pattaranad Bhiboonsawade, Mez Tharatorn, Thods...

3              NaN                                                   NaN

4      Alf Sjöberg                                    Ivar Lo-Johansson


                                               Actors View Rating  ...
\
0  Lina Leandersson, Kåre Hedebrant, Per Ragnar, ...           R  ...

1  Cleo, Paddy Considine, Beanie Feldstein, Dónal...           R  ...

2  Kathaleeya McIntosh, Nadech Kugimiya, Pimchano...         NaN  ...

3  Katarzyna Maciag, Piotr Nowak, Marcin Dorocins...         NaN  ...

4  Hugo Björne, Eva Dahlbeck, Ulf Palme, Ragnar F...         NaN  ...
```

```
   Awards Nominated For   Boxoffice  Release Date Netflix Release Date
\
0                  57.0  $21,22,065     12-Dec-08             04-03-21

1                   NaN    $70,632      08-May-20             04-03-21

2                   NaN         NaN     03-Dec-20             03-03-21

3                   4.0         NaN     14-Jun-11             03-03-21

4                   1.0         NaN     31-Oct-49             03-03-21


                          Production House  \
0               Canal+, Sandrew Metronome
1  Film 4, Monumental Pictures, Lionsgate
2                                     NaN
3                                     NaN
4                                     NaN

                             Netflix Link  \
0  https://www.netflix.com/watch/81415947
1  https://www.netflix.com/watch/81041267
2  https://www.netflix.com/watch/81306155
3  https://www.netflix.com/watch/81307527
4  https://www.netflix.com/watch/81382068

                                            Summary Series or
Movie  \
0  A med student with a supernatural gift tries t...          Series

1  When nerdy Johanna moves to London, things get...           Movie

2  After her ex-boyfriend cons her out of a large...           Movie

3  A group of social welfare workers led by their...          Series

4  An unhappily married farm worker struggling to...           Movie


  IMDb Votes                                                  Image
0   205926.0  https://occ-0-4708-64.1.nflxso.net/dnm/api/v6/...
1     2838.0  https://occ-0-1081-999.1.nflxso.net/dnm/api/v6...
2      131.0  https://occ-0-2188-64.1.nflxso.net/dnm/api/v6/...
3       47.0  https://occ-0-2508-2706.1.nflxso.net/dnm/api/v...
4       88.0  https://occ-0-2851-41.1.nflxso.net/dnm/api/v6/...

[5 rows x 22 columns]
```

Q.5. Demonstrate how to achieve a matplotlib operation using plotly.

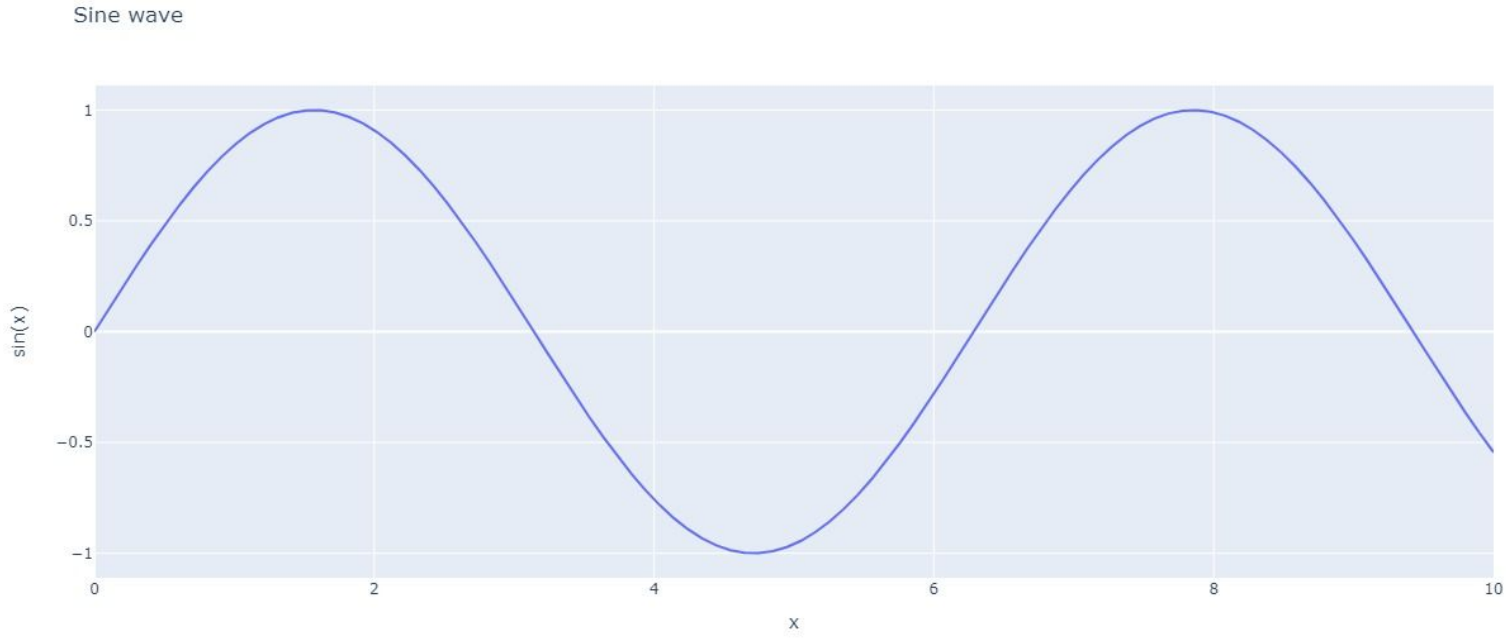
```
import matplotlib.pyplot as plt
import numpy as np

# Create some data
x = np.linspace(0, 10, 100)
y = np.sin(x)

# Create the plot
plt.plot(x, y)
plt.xlabel('x')
plt.ylabel('sin(x)')
plt.title('Sine wave')
plt.show()
```




```
import plotly.graph_objs as go
import plotly.offline as pyo

# Create the plot
```

```
trace = go.Scatter(x=x, y=y, mode='lines', name='sin(x)')
data = [trace]
layout = go.Layout(title='Sine wave', xaxis_title='x',
yaxis_title='sin(x)')
fig = go.Figure(data=data, layout=layout)

# Show the plot
pyo.plot(fig)
```

```
'temp-plot.html'
```


Sine wave
1
0.5
0
−0.5
−1
sin(x)
0
2
4
6
8
10
x