In [1]:
```python
from IPython import display
display.Image("1.png")
```
Out[1]:

Q1. Create a Pandas Series that contains the following data: 4, 8, 15, 16, 23, and 42. Then, print the series.

In [8]:
```python
import pandas as pd
data = [4, 8, 15, 16, 23, 42]
series = pd.Series(data)
series
```
Out[8]:
```
0     4
1     8
2    15
3    16
4    23
5    42
dtype: int64
```

In [2]:
```python
from IPython import display
display.Image("2.png")
```
Out[2]:

Q2. Create a variable of list type containing 10 elements in it, and apply pandas.Series function on the variable print it.

In [10]:
```python
variable = ['apple', 'mango', 'grapes', 'oranges', 'kiwi', 'banana', 'potato', 'tomato', 'onion', 'chilly']
data_frame = pd.DataFrame(variable)
data_frame
```
Out[10]:

	0
0	apple
1	mango
2	grapes
3	oranges
4	kiwi
5	banana
6	potato
7	tomato
8	onion
9	chilly

In [3]:
```python
from IPython import display
display.Image("3.png")
```
Out[3]:

Q3. Create a Pandas DataFrame that contains the following data:

Name	Age	Gender
Alice	25	Female
Bob	30	Male
Claire	27	Female

Then, print the DataFrame.

In [14]:
```python
data1 = {'Name': ['Alice', 'Bob', 'Claire'],
              'Age': [25, 30, 27],
              'Gender': ['Female', 'Male', 'Female']}

data_frame1 = pd.DataFrame(data1)
data_frame1
```
Out[14]:

	Name	Age	Gender
0	Alice	25	Female
1	Bob	30	Male
2	Claire	27	Female

In [4]:
```python
from IPython import display
display.Image("4.png")
```
Out[4]:

Q4. What is 'DataFrame' in pandas and how is it different from pandas.series? Explain with an example.

Ans. A DataFrame in pandas is a two-dimensional labeled data structure with columns of potentially different types. It is similar to a spreadsheet or a SQL table, where data is organized in rows and columns. Each column can contain a different type of data, such as numbers, strings, or dates.

A pandas Series is a one-dimensional labeled array that can contain data of any type, such as integers, strings, or booleans. It is similar to a column in a DataFrame.

In [16]:
```python
#data frame
data2 = {'fruits': ['mango', 'apple', 'banana', 'oranges', 'kiwi'],
       'vegetables': ['potato', 'onion', 'chilly', 'tomato', 'bottle gaurd'],
       'dishes': ['pav bhaji', 'idli sambhar', 'chole bhatore', 'babycorn chilly', 'sandwiches'],
       'shakes': ['mango shake', 'apple shake', 'banana shake', 'oreo shake', 'kitkat shake']}

data_frame2 = pd.DataFrame(data2)
data_frame2
```
Out[16]:

	fruits	vegetables	dishes	shakes
0	mango	potato	pav bhaji	mango shake
1	apple	onion	idli sambhar	apple shake
2	banana	chilly	chole bhatore	banana shake
3	oranges	tomato	babycorn chilly	oreo shake
4	kiwi	bottle gaurd	sandwiches	kitkat shake

In [19]:
```python
type(data_frame2)
```
Out[19]:
```
pandas.core.frame.DataFrame
```

In [18]:
```python
#pandas series
info = ['tanisha khaitan', 'tanishakhaitan@gmail.com', 8083762204, 'data scientist', 'python programming language']
series1 = pd.Series(info)
series1
```
Out[18]:
```
0                tanisha khaitan
1       tanishakhaitan@gmail.com
2                     8083762204
3                 data scientist
4    python programming language
dtype: object
```

In [20]:
```python
type(series1)
```
Out[20]:
```
pandas.core.series.Series
```

In [5]:
```python
from IPython import display
display.Image("5.png")
```
Out[5]:

Q5. What are some common functions you can use to manipulate data in a Pandas DataFrame? Can you give an example of when you might use one of these functions?

In [34]:
```python
#panda dataframe for showing some common function we can use to manipulate data

data3 = {'Name': ['Tanisha', 'Aman', 'Vivek', 'Shipra', 'Amisha'],
       'occupation': ['data scientist', 'gym trainer', 'banking', 'upsc', 'professor'],
       'Monthly income': [1200000, 40000, 500000, None, 30000],
        'Email id': ['tanishakhaitan@gmail.com', 'amankumar@gmail.com', 'vivekranjan@gmail.com', 'shiprasingh@gmail.com', 'amisharaj@gmail.com']
       }
data_frame3 = pd.DataFrame(data3)
data_frame3
```
Out[34]:

	Name	occupation	Monthly income	Email id
0	Tanisha	data scientist	1200000.0	tanishakhaitan@gmail.com
1	Aman	gym trainer	40000.0	amankumar@gmail.com
2	Vivek	banking	500000.0	vivekranjan@gmail.com
3	Shipra	upsc	NaN	shiprasingh@gmail.com
4	Amisha	professor	30000.0	amisharaj@gmail.com

In [35]:
```python
#dropna: removes any row
dropna = data_frame3.dropna()
dropna
```
Out[35]:

	Name	occupation	Monthly income	Email id
0	Tanisha	data scientist	1200000.0	tanishakhaitan@gmail.com
1	Aman	gym trainer	40000.0	amankumar@gmail.com
2	Vivek	banking	500000.0	vivekranjan@gmail.com
4	Amisha	professor	30000.0	amisharaj@gmail.com

In [37]:
```python
#fillna: fill the missing values
fillna = data_frame3.fillna(40000)
fillna
```
Out[37]:

	Name	occupation	Monthly income	Email id
0	Tanisha	data scientist	1200000.0	tanishakhaitan@gmail.com
1	Aman	gym trainer	40000.0	amankumar@gmail.com
2	Vivek	banking	500000.0	vivekranjan@gmail.com
3	Shipra	upsc	40000.0	shiprasingh@gmail.com
4	Amisha	professor	30000.0	amisharaj@gmail.com

In [39]:
```python
#sort values: will sort in ascending or descending
sort_values = data_frame3.sort_values(by='Monthly income', ascending = True)
sort_values
```
Out[39]:

	Name	occupation	Monthly income	Email id
4	Amisha	professor	30000.0	amisharaj@gmail.com
1	Aman	gym trainer	40000.0	amankumar@gmail.com
2	Vivek	banking	500000.0	vivekranjan@gmail.com
0	Tanisha	data scientist	1200000.0	tanishakhaitan@gmail.com
3	Shipra	upsc	NaN	shiprasingh@gmail.com

In [36]:
```python
from IPython import display
display.Image("6.png")
```
Out[36]:

Q6. Which of the following is mutable in nature Series, DataFrame, Panel?

Ans. Data frame and series are mutable whiuch means we can do changes in both the types of data and can manipulate it, while panel are immutable which means we can't do any changes or manipulation to our data in panel if we try to do it will create or generate another object.

In [7]:
```python
from IPython import display
display.Image("7.png")
```
Out[7]:

Q7. Create a DataFrame using multiple Series. Explain with an example.

In [47]:
```python
# multiple series
Name = pd.Series(['Tanisha', 'Isha', 'Samyak', 'Samkit', 'Swati'])
Email_id = pd.Series(['tanishakhaitan@gmail.com', 'ishakhaitan@gmail.com', 'samyakjain@gmail.com', 'samkitjain@gmail.com', 'swatikesari@gmail.com'])
Age = pd.Series([21, 25, 24, 23, 23])
Blood_group = pd.Series(['o', 'a', 'a', 'b', 'o'])

# creating data frame from multiple series
df = pd.concat([Name, Email_id,Blood_group, Age], axis = 1)
df.columns = ['Name', 'Email _id', 'Blood_group', 'Age']
df
```
Out[47]:

	Name	Email _id	Blood_group	Age
0	Tanisha	tanishakhaitan@gmail.com	o	21
1	Isha	ishakhaitan@gmail.com	a	25
2	Samyak	samyakjain@gmail.com	a	24
3	Samkit	samkitjain@gmail.com	b	23
4	Swati	swatikesari@gmail.com	o	23

In [ ]: