```
In [1]: import pandas as pd
```

```
In [4]: df=pd.read_csv(r"D:\Data Science with AI\Data Science With AI\9th,10th - july-Pa
```

```
In [5]: df
```

Out[5]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

```
In [6]: id(df)
```

Out[6]: 2486938350896

```
In [7]: type(df)
```

Out[7]: pandas.core.frame.DataFrame

```
In [8]: len(df)
```

Out[8]: 195

```
In [9]: df.isnull()
```

Out[9]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
190	False	False	False	False	False
191	False	False	False	False	False
192	False	False	False	False	False
193	False	False	False	False	False
194	False	False	False	False	False

195 rows × 5 columns

In [10]:
```python
df.isna()
```

Out[10]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
190	False	False	False	False	False
191	False	False	False	False	False
192	False	False	False	False	False
193	False	False	False	False	False
194	False	False	False	False	False

195 rows × 5 columns

In [11]:
```python
df.columns()
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[11], line 1
----> 1 df.columns()

TypeError: 'Index' object is not callable
```

In [12]: `df.columns`

Out[12]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [13]: `len(df.columns)`

Out[13]: 5

In [14]: `df.isnull()`

Out[14]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
190	False	False	False	False	False
191	False	False	False	False	False
192	False	False	False	False	False
193	False	False	False	False	False
194	False	False	False	False	False

195 rows × 5 columns

In [15]: `df.head()`

Out[15]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income

In [16]: `df.tail()`

Out[16]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

In [17]:
```python
df.isnull().sum()
```

Out[17]:
```
CountryName      0
CountryCode      0
BirthRate        0
InternetUsers    0
IncomeGroup      0
dtype: int64
```

In [18]:
```python
df.isna().sum()
```

Out[18]:
```
CountryName      0
CountryCode      0
BirthRate        0
InternetUsers    0
IncomeGroup      0
dtype: int64
```

In [19]:
```python
df[:]
```

Out[19]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

In [20]:
```python
df[2:6]
```

Out[20]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
5	Argentina	ARG	17.716	59.9	High income

In [21]:
```python
df[2:99:2]
```

Out[21]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
2	Angola	AGO	45.985	19.100000	Upper middle income
4	United Arab Emirates	ARE	11.044	88.000000	High income
6	Armenia	ARM	13.308	41.900000	Lower middle income
8	Australia	AUS	13.200	83.000000	High income
10	Azerbaijan	AZE	18.300	58.700000	Upper middle income
12	Belgium	BEL	11.200	82.170200	High income
14	Burkina Faso	BFA	40.551	9.100000	Low income
16	Bulgaria	BGR	9.200	53.061500	Upper middle income
18	Bahamas, The	BHS	15.339	72.000000	High income
20	Belarus	BLR	12.500	54.170000	Upper middle income
22	Bermuda	BMU	10.400	95.300000	High income
24	Brazil	BRA	14.931	51.040000	Upper middle income
26	Brunei Darussalam	BRN	16.405	64.500000	High income
28	Botswana	BWA	25.267	15.000000	Upper middle income
30	Canada	CAN	10.900	85.800000	High income
32	Chile	CHL	13.385	66.500000	High income
34	Cote d'Ivoire	CIV	37.320	8.400000	Lower middle income
36	Congo, Rep.	COG	37.011	6.600000	Lower middle income
38	Comoros	COM	34.326	6.500000	Low income
40	Costa Rica	CRI	15.022	45.960000	Upper middle income
42	Cayman Islands	CYM	12.500	74.100000	High income
44	Czech Republic	CZE	10.200	74.110400	High income
46	Djibouti	DJI	25.486	9.500000	Lower middle income
48	Dominican Republic	DOM	21.198	45.900000	Upper middle income
50	Ecuador	ECU	21.070	40.353684	Upper middle income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
52	Eritrea	ERI	34.800	0.900000	Low income
54	Estonia	EST	10.300	79.400000	High income
56	Finland	FIN	10.700	91.514400	High income
58	France	FRA	12.300	81.919800	High income
60	Gabon	GAB	30.555	9.200000	Upper middle income
62	Georgia	GEO	13.332	43.300000	Lower middle income
64	Guinea	GIN	37.337	1.600000	Low income
66	Guinea-Bissau	GNB	37.503	3.100000	Low income
68	Greece	GRC	8.500	59.866300	High income
70	Greenland	GRL	14.500	65.800000	High income
72	Guam	GUM	17.389	65.400000	High income
74	Hong Kong SAR, China	HKG	7.900	74.200000	High income
76	Croatia	HRV	9.400	66.747600	High income
78	Hungary	HUN	9.200	72.643900	High income
80	India	IND	20.291	15.100000	Lower middle income
82	Iran, Islamic Rep.	IRN	17.900	29.950000	Upper middle income
84	Iceland	ISL	13.400	96.546800	High income
86	Italy	ITA	8.500	58.459300	High income
88	Jordan	JOR	27.046	41.000000	Upper middle income
90	Kazakhstan	KAZ	22.730	54.000000	Upper middle income
92	Kyrgyz Republic	KGZ	27.200	23.000000	Lower middle income
94	Kiribati	KIR	29.044	11.500000	Lower middle income
96	Kuwait	KWT	20.575	75.460000	High income
98	Lebanon	LBN	13.426	70.500000	Upper middle income

```
In [22]: df[::-1]
```

Out[22]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.5	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
191	South Africa	ZAF	20.850	46.5	Upper middle income
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
...	...	...	...	...	...
4	United Arab Emirates	ARE	11.044	88.0	High income
3	Albania	ALB	12.877	57.2	Upper middle income
2	Angola	AGO	45.985	19.1	Upper middle income
1	Afghanistan	AFG	35.253	5.9	Low income
0	Aruba	ABW	10.244	78.9	High income

195 rows × 5 columns

In [23]: df

Out[23]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

In [ ]: