

Lab 18

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Date :- 03-10-2023

Enrollment No :- 92200133030

CO1: To write, test, and debug simple Python programs

CO2: To implement Python programs with conditional, loops and functions

Task 1:- Write CSV Files Using Pandas

Python Code:

```
import pandas as pd
data = {
    'CHN': {'COUNTRY': 'China', 'POP': 1_398.72, 'AREA': 9_596.96,
            'GDP': 12_234.78, 'CONT': 'Asia'},
    'IND': {'COUNTRY': 'India', 'POP': 1_351.16, 'AREA': 3_287.26,
            'GDP': 2_575.67, 'CONT': 'Asia', 'IND_DAY': '1947-08-15'},
    'USA': {'COUNTRY': 'US', 'POP': 329.74, 'AREA': 9_833.52,
            'GDP': 19_485.39, 'CONT': 'N.America',
            'IND_DAY': '1776-07-04'},
    'IDN': {'COUNTRY': 'Indonesia', 'POP': 268.07, 'AREA': 1_910.93,
            'GDP': 1_015.54, 'CONT': 'Asia', 'IND_DAY': '1945-08-17'},
    'BRA': {'COUNTRY': 'Brazil', 'POP': 210.32, 'AREA': 8_515.77,
            'GDP': 2_055.51, 'CONT': 'S.America', 'IND_DAY': '1822-09-07'},
    'PAK': {'COUNTRY': 'Pakistan', 'POP': 205.71, 'AREA': 881.91,
            'GDP': 302.14, 'CONT': 'Asia', 'IND_DAY': '1947-08-14'},
    'NGA': {'COUNTRY': 'Nigeria', 'POP': 200.96, 'AREA': 923.77,
            'GDP': 375.77, 'CONT': 'Africa', 'IND_DAY': '1960-10-01'},
    'BGD': {'COUNTRY': 'Bangladesh', 'POP': 167.09, 'AREA': 147.57,
            'GDP': 245.63, 'CONT': 'Asia', 'IND_DAY': '1971-03-26'},
    'RUS': {'COUNTRY': 'Russia', 'POP': 146.79, 'AREA': 17_098.25,
            'GDP': 1_530.75, 'IND_DAY': '1992-06-12'},
    'MEX': {'COUNTRY': 'Mexico', 'POP': 126.58, 'AREA': 1_964.38,
            'GDP': 1_158.23, 'CONT': 'N.America', 'IND_DAY': '1810-09-16'},
    'JPN': {'COUNTRY': 'Japan', 'POP': 126.22, 'AREA': 377.97,
            'GDP': 4_872.42, 'CONT': 'Asia'},
    'DEU': {'COUNTRY': 'Germany', 'POP': 83.02, 'AREA': 357.11,
            'GDP': 3_693.20, 'CONT': 'Europe'},
    'FRA': {'COUNTRY': 'France', 'POP': 67.02, 'AREA': 640.68,
            'GDP': 2_582.49, 'CONT': 'Europe', 'IND_DAY': '1789-07-14'},
    'GBR': {'COUNTRY': 'UK', 'POP': 66.44, 'AREA': 242.50,
            'GDP': 2_631.23, 'CONT': 'Europe'},
    'ITA': {'COUNTRY': 'Italy', 'POP': 60.36, 'AREA': 301.34,
            'GDP': 1_943.84, 'CONT': 'Europe'}
```

```
'ARG': {'COUNTRY': 'Argentina', 'POP': 44.94, 'AREA': 2_780.40,
        'GDP': 637.49, 'CONT': 'S.America', 'IND_DAY': '1816-07-09'},
'DZA': {'COUNTRY': 'Algeria', 'POP': 43.38, 'AREA': 2_381.74,
        'GDP': 167.56, 'CONT': 'Africa', 'IND_DAY': '1962-07-05'},
'CAN': {'COUNTRY': 'Canada', 'POP': 37.59, 'AREA': 9_984.67,
        'GDP': 1_647.12, 'CONT': 'N.America', 'IND_DAY': '1867-07-01'},
'AUS': {'COUNTRY': 'Australia', 'POP': 25.47, 'AREA': 7_692.02,
        'GDP': 1_408.68, 'CONT': 'Oceania'},
'KAZ': {'COUNTRY': 'Kazakhstan', 'POP': 18.53, 'AREA': 2_724.90,
        'GDP': 159.41, 'CONT': 'Asia', 'IND_DAY': '1991-12-16'}
}
```

```
columns = ('COUNTRY', 'POP', 'AREA', 'GDP', 'CONT', 'IND_DAY')
df = pd.DataFrame(data=data).T
df.to_csv('data.csv')
```

```
df2 = pd.DataFrame(data=data, index=columns).T
print(df2)
```

Output:

	A	B	C	D	E	F	G
1		COUNTRY	POP	AREA	GDP	CONT	IND_DAY
2	CHN	China	1398.72	9596.96	12234.78	Asia	
3	IND	India	1351.16	3287.26	2575.67	Asia	#####
4	USA	US	329.74	9833.52	19485.39	N.America	1776-07-04
5	IDN	Indonesia	268.07	1910.93	1015.54	Asia	#####
6	BRA	Brazil	210.32	8515.77	2055.51	S.America	1822-09-07
7	PAK	Pakistan	205.71	881.91	302.14	Asia	#####
8	NGA	Nigeria	200.96	923.77	375.77	Africa	#####
9	BGD	Banglades	167.09	147.57	245.63	Asia	#####
10	RUS	Russia	146.79	17098.25	1530.75		#####
11	MEX	Mexico	126.58	1964.38	1158.23	N.America	1810-09-16
12	JPN	Japan	126.22	377.97	4872.42	Asia	
13	DEU	Germany	83.02	357.11	3693.2	Europe	
14	FRA	France	67.02	640.68	2582.49	Europe	1789-07-14
15	GBR	UK	66.44	242.5	2631.23	Europe	
16	ITA	Italy	60.36	301.34	1943.84	Europe	
17	ARG	Argentina	44.94	2780.4	637.49	S.America	1816-07-09
18	DZA	Algeria	43.38	2381.74	167.56	Africa	#####
19	CAN	Canada	37.59	9984.67	1647.12	N.America	1867-07-01
20	AUS	Australia	25.47	7692.02	1408.68	Oceania	
21	KAZ	Kazakhsta	18.53	2724.9	159.41	Asia	#####

Task 2:- Read CSV Files Using Pandas

Python Code:

```
import pandas as pd
df3 = pd.read_csv('data.csv', index_col=0)
print(df3)
```

Output:

```
PS C:\Users\abc> & D:/DLLs/Anaconda/python.exe "d:/Aryan/Semester - 3/Programming With
```

	COUNTRY	POP	AREA	GDP	CONT	IND_DAY
CHN	China	1398.72	9596.96	12234.78	Asia	NaN
IND	India	1351.16	3287.26	2575.67	Asia	1947-08-15
USA	US	329.74	9833.52	19485.39	N.America	1776-07-04
IDN	Indonesia	268.07	1910.93	1015.54	Asia	1945-08-17
BRA	Brazil	210.32	8515.77	2055.51	S.America	1822-09-07
PAK	Pakistan	205.71	881.91	302.14	Asia	1947-08-14
NGA	Nigeria	200.96	923.77	375.77	Africa	1960-10-01
BGD	Bangladesh	167.09	147.57	245.63	Asia	1971-03-26
RUS	Russia	146.79	17098.25	1530.75	NaN	1992-06-12
MEX	Mexico	126.58	1964.38	1158.23	N.America	1810-09-16
JPN	Japan	126.22	377.97	4872.42	Asia	NaN
DEU	Germany	83.02	357.11	3693.20	Europe	NaN
FRA	France	67.02	640.68	2582.49	Europe	1789-07-14
GBR	UK	66.44	242.50	2631.23	Europe	NaN
ITA	Italy	60.36	301.34	1943.84	Europe	NaN
ARG	Argentina	44.94	2780.40	637.49	S.America	1816-07-09
DZA	Algeria	43.38	2381.74	167.56	Africa	1962-07-05
CAN	Canada	37.59	9984.67	1647.12	N.America	1867-07-01
AUS	Australia	25.47	7692.02	1408.68	Oceania	NaN
KAZ	Kazakhstan	18.53	2724.90	159.41	Asia	1991-12-16

Task 3:- Write Excel Files Using Pandas

Python Code:

```
import pandas as pd
data = {
    'CHN': {'COUNTRY': 'China', 'POP': 1_398.72, 'AREA': 9_596.96,
            'GDP': 12_234.78, 'CONT': 'Asia'},
    'IND': {'COUNTRY': 'India', 'POP': 1_351.16, 'AREA': 3_287.26,
            'GDP': 2_575.67, 'CONT': 'Asia', 'IND_DAY': '1947-08-15'},
    'USA': {'COUNTRY': 'US', 'POP': 329.74, 'AREA': 9_833.52,
            'GDP': 19_485.39, 'CONT': 'N.America',
            'IND_DAY': '1776-07-04'},
    'IDN': {'COUNTRY': 'Indonesia', 'POP': 268.07, 'AREA': 1_910.93,
            'GDP': 1_015.54, 'CONT': 'Asia', 'IND_DAY': '1945-08-17'},
    'BRA': {'COUNTRY': 'Brazil', 'POP': 210.32, 'AREA': 8_515.77,
            'GDP': 2_055.51, 'CONT': 'S.America', 'IND_DAY': '1822-09-07'},
    'PAK': {'COUNTRY': 'Pakistan', 'POP': 205.71, 'AREA': 881.91,
            'GDP': 302.14, 'CONT': 'Asia', 'IND_DAY': '1947-08-14'},
    'NGA': {'COUNTRY': 'Nigeria', 'POP': 200.96, 'AREA': 923.77,
```

```
'GDP': 375.77, 'CONT': 'Africa', 'IND_DAY': '1960-10-01'},
'BGD': {'COUNTRY': 'Bangladesh', 'POP': 167.09, 'AREA': 147.57,
        'GDP': 245.63, 'CONT': 'Asia', 'IND_DAY': '1971-03-26'},
'RUS': {'COUNTRY': 'Russia', 'POP': 146.79, 'AREA': 17_098.25,
        'GDP': 1_530.75, 'IND_DAY': '1992-06-12'},
'MEX': {'COUNTRY': 'Mexico', 'POP': 126.58, 'AREA': 1_964.38,
        'GDP': 1_158.23, 'CONT': 'N.America', 'IND_DAY': '1810-09-16'},
'JPN': {'COUNTRY': 'Japan', 'POP': 126.22, 'AREA': 377.97,
        'GDP': 4_872.42, 'CONT': 'Asia'},
'DEU': {'COUNTRY': 'Germany', 'POP': 83.02, 'AREA': 357.11,
        'GDP': 3_693.20, 'CONT': 'Europe'},
'FRA': {'COUNTRY': 'France', 'POP': 67.02, 'AREA': 640.68,
        'GDP': 2_582.49, 'CONT': 'Europe', 'IND_DAY': '1789-07-14'},
'GBR': {'COUNTRY': 'UK', 'POP': 66.44, 'AREA': 242.50,
        'GDP': 2_631.23, 'CONT': 'Europe'},
'ITA': {'COUNTRY': 'Italy', 'POP': 60.36, 'AREA': 301.34,
        'GDP': 1_943.84, 'CONT': 'Europe'},
'ARG': {'COUNTRY': 'Argentina', 'POP': 44.94, 'AREA': 2_780.40,
        'GDP': 637.49, 'CONT': 'S.America', 'IND_DAY': '1816-07-09'},
'DZA': {'COUNTRY': 'Algeria', 'POP': 43.38, 'AREA': 2_381.74,
        'GDP': 167.56, 'CONT': 'Africa', 'IND_DAY': '1962-07-05'},
'CAN': {'COUNTRY': 'Canada', 'POP': 37.59, 'AREA': 9_984.67,
        'GDP': 1_647.12, 'CONT': 'N.America', 'IND_DAY': '1867-07-01'},
'AUS': {'COUNTRY': 'Australia', 'POP': 25.47, 'AREA': 7_692.02,
        'GDP': 1_408.68, 'CONT': 'Oceania'},
'KAZ': {'COUNTRY': 'Kazakhstan', 'POP': 18.53, 'AREA': 2_724.90,
        'GDP': 159.41, 'CONT': 'Asia', 'IND_DAY': '1991-12-16'}
}
```

```
columns = ('COUNTRY', 'POP', 'AREA', 'GDP', 'CONT', 'IND_DAY')
df4 = pd.DataFrame(data=data, index=columns).T
df4.to_excel('data.xlsx')
```

Output:

	A	B	C	D	E	F	G
1		COUNTRY	POP	AREA	GDP	CONT	IND_DAY
2	CHN	China	1398.72	9596.96	12234.78	Asia	
3	IND	India	1351.16	3287.26	2575.67	Asia	1947-08-15
4	USA	US	329.74	9833.52	19485.39	N.America	1776-07-04
5	IDN	Indonesia	268.07	1910.93	1015.54	Asia	1945-08-17
6	BRA	Brazil	210.32	8515.77	2055.51	S.America	1822-09-07
7	PAK	Pakistan	205.71	881.91	302.14	Asia	1947-08-14
8	NGA	Nigeria	200.96	923.77	375.77	Africa	1960-10-01
9	BGD	Bangladesh	167.09	147.57	245.63	Asia	1971-03-26
10	RUS	Russia	146.79	17098.25	1530.75		1992-06-12
11	MEX	Mexico	126.58	1964.38	1158.23	N.America	1810-09-16
12	JPN	Japan	126.22	377.97	4872.42	Asia	
13	DEU	Germany	83.02	357.11	3693.2	Europe	
14	FRA	France	67.02	640.68	2582.49	Europe	1789-07-14
15	GBR	UK	66.44	242.5	2631.23	Europe	
16	ITA	Italy	60.36	301.34	1943.84	Europe	
17	ARG	Argentina	44.94	2780.4	637.49	S.America	1816-07-09
18	DZA	Algeria	43.38	2381.74	167.56	Africa	1962-07-05
19	CAN	Canada	37.59	9984.67	1647.12	N.America	1867-07-01
20	AUS	Australia	25.47	7692.02	1408.68	Oceania	
21	KAZ	Kazakhstan	18.53	2724.9	159.41	Asia	1991-12-16

Task 4:- Checking The DataTypes of Each Column In Dataframe

Python Code:

```
import pandas as pd
df5 = pd.read_excel('data.xlsx', index_col=0)
print(pd)
```

Output:

```
PS C:\Users\abc> & D:/DLLs/Anaconda/python.exe "d:/Aryan/Semester - 3/Programming With
COUNTRY      POP      AREA      GDP      CONT      IND_DAY
CHN      China  1398.72  9596.96  12234.78      Asia      NaN
IND      India  1351.16  3287.26  2575.67      Asia  1947-08-15
USA      US    329.74  9833.52  19485.39  N.America  1776-07-04
IDN      Indonesia  268.07  1910.93  1015.54      Asia  1945-08-17
BRA      Brazil  210.32  8515.77  2055.51  S.America  1822-09-07
PAK      Pakistan  205.71  881.91  302.14      Asia  1947-08-14
NGA      Nigeria  200.96  923.77  375.77      Africa  1960-10-01
BGD      Bangladesh  167.09  147.57  245.63      Asia  1971-03-26
RUS      Russia  146.79  17098.25  1530.75      NaN  1992-06-12
MEX      Mexico  126.58  1964.38  1158.23  N.America  1810-09-16
JPN      Japan  126.22  377.97  4872.42      Asia      NaN
DEU      Germany  83.02  357.11  3693.20      Europe      NaN
FRA      France  67.02  640.68  2582.49      Europe  1789-07-14
GBR      UK    66.44  242.50  2631.23      Europe      NaN
ITA      Italy  60.36  301.34  1943.84      Europe      NaN
ARG      Argentina  44.94  2780.40  637.49  S.America  1816-07-09
DZA      Algeria  43.38  2381.74  167.56      Africa  1962-07-05
CAN      Canada  37.59  9984.67  1647.12  N.America  1867-07-01
AUS      Australia  25.47  7692.02  1408.68  Oceania      NaN
KAZ      Kazakhstan  18.53  2724.90  159.41      Asia  1991-12-16
```


Task 5:- Write json File**Python Code:**

```
import pandas as pd
data = {
    'CHN': {'COUNTRY': 'China', 'POP': 1_398.72, 'AREA': 9_596.96,
            'GDP': 12_234.78, 'CONT': 'Asia'},
    'IND': {'COUNTRY': 'India', 'POP': 1_351.16, 'AREA': 3_287.26,
            'GDP': 2_575.67, 'CONT': 'Asia', 'IND_DAY': '1947-08-15'},
    'USA': {'COUNTRY': 'US', 'POP': 329.74, 'AREA': 9_833.52,
            'GDP': 19_485.39, 'CONT': 'N.America',
            'IND_DAY': '1776-07-04'},
    'IDN': {'COUNTRY': 'Indonesia', 'POP': 268.07, 'AREA': 1_910.93,
            'GDP': 1_015.54, 'CONT': 'Asia', 'IND_DAY': '1945-08-17'},
    'BRA': {'COUNTRY': 'Brazil', 'POP': 210.32, 'AREA': 8_515.77,
            'GDP': 2_055.51, 'CONT': 'S.America', 'IND_DAY': '1822-09-07'},
    'PAK': {'COUNTRY': 'Pakistan', 'POP': 205.71, 'AREA': 881.91,
            'GDP': 302.14, 'CONT': 'Asia', 'IND_DAY': '1947-08-14'},
    'NGA': {'COUNTRY': 'Nigeria', 'POP': 200.96, 'AREA': 923.77,
            'GDP': 375.77, 'CONT': 'Africa', 'IND_DAY': '1960-10-01'},
    'BGD': {'COUNTRY': 'Bangladesh', 'POP': 167.09, 'AREA': 147.57,
            'GDP': 245.63, 'CONT': 'Asia', 'IND_DAY': '1971-03-26'},
    'RUS': {'COUNTRY': 'Russia', 'POP': 146.79, 'AREA': 17_098.25,
            'GDP': 1_530.75, 'IND_DAY': '1992-06-12'},
    'MEX': {'COUNTRY': 'Mexico', 'POP': 126.58, 'AREA': 1_964.38,
            'GDP': 1_158.23, 'CONT': 'N.America', 'IND_DAY': '1810-09-16'},
    'JPN': {'COUNTRY': 'Japan', 'POP': 126.22, 'AREA': 377.97,
            'GDP': 4_872.42, 'CONT': 'Asia'},
    'DEU': {'COUNTRY': 'Germany', 'POP': 83.02, 'AREA': 357.11,
            'GDP': 3_693.20, 'CONT': 'Europe'},
    'FRA': {'COUNTRY': 'France', 'POP': 67.02, 'AREA': 640.68,
            'GDP': 2_582.49, 'CONT': 'Europe', 'IND_DAY': '1789-07-14'},
    'GBR': {'COUNTRY': 'UK', 'POP': 66.44, 'AREA': 242.50,
            'GDP': 2_631.23, 'CONT': 'Europe'},
    'ITA': {'COUNTRY': 'Italy', 'POP': 60.36, 'AREA': 301.34,
            'GDP': 1_943.84, 'CONT': 'Europe'},
    'ARG': {'COUNTRY': 'Argentina', 'POP': 44.94, 'AREA': 2_780.40,
            'GDP': 637.49, 'CONT': 'S.America', 'IND_DAY': '1816-07-09'},
    'DZA': {'COUNTRY': 'Algeria', 'POP': 43.38, 'AREA': 2_381.74,
            'GDP': 167.56, 'CONT': 'Africa', 'IND_DAY': '1962-07-05'},
    'CAN': {'COUNTRY': 'Canada', 'POP': 37.59, 'AREA': 9_984.67,
            'GDP': 1_647.12, 'CONT': 'N.America', 'IND_DAY': '1867-07-01'},
    'AUS': {'COUNTRY': 'Australia', 'POP': 25.47, 'AREA': 7_692.02,
            'GDP': 1_408.68, 'CONT': 'Oceania'},
    'KAZ': {'COUNTRY': 'Kazakhstan', 'POP': 18.53, 'AREA': 2_724.90,
            'GDP': 159.41, 'CONT': 'Asia', 'IND_DAY': '1991-12-16'}
}
```

```
columns = ('COUNTRY', 'POP', 'AREA', 'GDP', 'CONT', 'IND_DAY')
```

```
df6 = pd.DataFrame(data=data, index=columns).T
```

```
df6.to_json('data.json')
```

Output:

```
{
  "COUNTRY": {
    "CHN": "China", "IND": "India", "USA": "US", "IDN": "Indonesia", "BRA": "Brazil", "PAK": "Pakistan", "NGA": "Nigeria",
    "BGD": "Bangladesh", "RUS": "Russia", "MEX": "Mexico", "JPN": "Japan", "DEU": "Germany", "FRA": "France", "GBR": "UK",
    "ITA": "Italy", "ARG": "Argentina", "DZA": "Algeria", "CAN": "Canada", "AUS": "Australia", "KAZ": "Kazakhstan"},
    "POP": {
      "CHN": 1398.72, "IND": 1351.16, "USA": 329.74, "IDN": 268.07, "BRA": 210.32, "PAK": 205.71, "NGA": 200.96,
      "BGD": 167.09, "RUS": 146.79, "MEX": 126.58, "JPN": 126.22, "DEU": 83.02, "FRA": 67.02, "GBR": 66.44, "ITA": 60.36,
      "ARG": 44.94, "DZA": 43.38, "CAN": 37.59, "AUS": 25.47, "KAZ": 18.53},
    "AREA": {
      "CHN": 9596.96, "IND": 3287.26, "USA": 9833.52, "IDN": 1910.93, "BRA": 8515.77, "PAK": 881.91, "NGA": 923.77,
      "BGD": 147.57, "RUS": 17098.25, "MEX": 1964.38, "JPN": 377.97, "DEU": 357.11, "FRA": 640.68, "GBR": 242.5, "ITA": 301.34,
      "ARG": 2780.4, "DZA": 2381.74, "CAN": 9984.67, "AUS": 7692.02, "KAZ": 2724.9},
    "GDP": {
      "CHN": 12234.78, "IND": 2575.67, "USA": 19485.39, "IDN": 1015.54, "BRA": 2055.51, "PAK": 302.14, "NGA": 375.77,
      "BGD": 245.63, "RUS": 1530.75, "MEX": 1158.23, "JPN": 4872.42, "DEU": 3693.2, "FRA": 2582.49, "GBR": 2631.23, "ITA": 1943.84,
      "ARG": 637.49, "DZA": 167.56, "CAN": 1647.12, "AUS": 1408.68, "KAZ": 159.41},
    "CONT": {
      "CHN": "Asia", "IND": "Asia", "USA": "N.America", "IDN": "Asia", "BRA": "S.America", "PAK": "Asia", "NGA": "Africa",
      "BGD": "Asia", "RUS": null, "MEX": "N.America", "JPN": "Asia", "DEU": "Europe", "FRA": "Europe", "GBR": "Europe", "ITA": "Europe",
      "ARG": "S.America", "DZA": "Africa", "CAN": "N.America", "AUS": "Oceania", "KAZ": "Asia"},
    "IND_DAY": {
      "CHN": null, "IND": "1947-08-15", "USA": "1776-07-04", "IDN": "1945-08-17", "BRA": "1822-09-07", "PAK": "1947-08-14",
      "NGA": "1960-10-01", "BGD": "1971-03-26", "RUS": "1992-06-12", "MEX": "1810-09-16", "JPN": null, "DEU": null, "FRA": "1789-07-14",
      "GBR": null, "ITA": null, "ARG": "1816-07-09", "DZA": "1962-07-05", "CAN": "1867-07-01", "AUS": null, "KAZ": "1991-12-16"}
  }
```

Task 6:- Read json

Python Code:

```
import pandas as pd
```

```
df7 = pd.read_json('data.json')
```

```
print(df7)
```

Output:

```
PS C:\Users\abc> & D:/DLLs/Anaconda/python.exe "d:/Aryan/Semester - 3/Programming With
COUNTRY POP AREA GDP CONT IND_DAY
CHN China 1398.72 9596.96 12234.78 Asia NaN
IND India 1351.16 3287.26 2575.67 Asia 1947-08-15
USA US 329.74 9833.52 19485.39 N.America 1776-07-04
IDN Indonesia 268.07 1910.93 1015.54 Asia 1945-08-17
BRA Brazil 210.32 8515.77 2055.51 S.America 1822-09-07
PAK Pakistan 205.71 881.91 302.14 Asia 1947-08-14
NGA Nigeria 200.96 923.77 375.77 Africa 1960-10-01
BGD Bangladesh 167.09 147.57 245.63 Asia 1971-03-26
RUS Russia 146.79 17098.25 1530.75 NaN 1992-06-12
MEX Mexico 126.58 1964.38 1158.23 N.America 1810-09-16
JPN Japan 126.22 377.97 4872.42 Asia NaN
DEU Germany 83.02 357.11 3693.20 Europe NaN
FRA France 67.02 640.68 2582.49 Europe 1789-07-14
GBR UK 66.44 242.50 2631.23 Europe NaN
ITA Italy 60.36 301.34 1943.84 Europe NaN
ARG Argentina 44.94 2780.40 637.49 S.America 1816-07-09
DZA Algeria 43.38 2381.74 167.56 Africa 1962-07-05
CAN Canada 37.59 9984.67 1647.12 N.America 1867-07-01
AUS Australia 25.47 7692.02 1408.68 Oceania NaN
KAZ Kazakhstan 18.53 2724.90 159.41 Asia 1991-12-16
```

Task 7:- Read HTML**Python Code:**

```
import pandas as pd
data = {
    'CHN': {'COUNTRY': 'China', 'POP': 1_398.72, 'AREA': 9_596.96,
            'GDP': 12_234.78, 'CONT': 'Asia'},
    'IND': {'COUNTRY': 'India', 'POP': 1_351.16, 'AREA': 3_287.26,
            'GDP': 2_575.67, 'CONT': 'Asia', 'IND_DAY': '1947-08-15'},
    'USA': {'COUNTRY': 'US', 'POP': 329.74, 'AREA': 9_833.52,
            'GDP': 19_485.39, 'CONT': 'N.America',
            'IND_DAY': '1776-07-04'},
    'IDN': {'COUNTRY': 'Indonesia', 'POP': 268.07, 'AREA': 1_910.93,
            'GDP': 1_015.54, 'CONT': 'Asia', 'IND_DAY': '1945-08-17'},
    'BRA': {'COUNTRY': 'Brazil', 'POP': 210.32, 'AREA': 8_515.77,
            'GDP': 2_055.51, 'CONT': 'S.America', 'IND_DAY': '1822-09-07'},
    'PAK': {'COUNTRY': 'Pakistan', 'POP': 205.71, 'AREA': 881.91,
            'GDP': 302.14, 'CONT': 'Asia', 'IND_DAY': '1947-08-14'},
    'NGA': {'COUNTRY': 'Nigeria', 'POP': 200.96, 'AREA': 923.77,
            'GDP': 375.77, 'CONT': 'Africa', 'IND_DAY': '1960-10-01'},
    'BGD': {'COUNTRY': 'Bangladesh', 'POP': 167.09, 'AREA': 147.57,
            'GDP': 245.63, 'CONT': 'Asia', 'IND_DAY': '1971-03-26'},
    'RUS': {'COUNTRY': 'Russia', 'POP': 146.79, 'AREA': 17_098.25,
            'GDP': 1_530.75, 'IND_DAY': '1992-06-12'},
    'MEX': {'COUNTRY': 'Mexico', 'POP': 126.58, 'AREA': 1_964.38,
            'GDP': 1_158.23, 'CONT': 'N.America', 'IND_DAY': '1810-09-16'},
    'JPN': {'COUNTRY': 'Japan', 'POP': 126.22, 'AREA': 377.97,
            'GDP': 4_872.42, 'CONT': 'Asia'},
    'DEU': {'COUNTRY': 'Germany', 'POP': 83.02, 'AREA': 357.11,
            'GDP': 3_693.20, 'CONT': 'Europe'},
    'FRA': {'COUNTRY': 'France', 'POP': 67.02, 'AREA': 640.68,
            'GDP': 2_582.49, 'CONT': 'Europe', 'IND_DAY': '1789-07-14'},
    'GBR': {'COUNTRY': 'UK', 'POP': 66.44, 'AREA': 242.50,
            'GDP': 2_631.23, 'CONT': 'Europe'},
    'ITA': {'COUNTRY': 'Italy', 'POP': 60.36, 'AREA': 301.34,
            'GDP': 1_943.84, 'CONT': 'Europe'},
    'ARG': {'COUNTRY': 'Argentina', 'POP': 44.94, 'AREA': 2_780.40,
            'GDP': 637.49, 'CONT': 'S.America', 'IND_DAY': '1816-07-09'},
    'DZA': {'COUNTRY': 'Algeria', 'POP': 43.38, 'AREA': 2_381.74,
            'GDP': 167.56, 'CONT': 'Africa', 'IND_DAY': '1962-07-05'},
    'CAN': {'COUNTRY': 'Canada', 'POP': 37.59, 'AREA': 9_984.67,
            'GDP': 1_647.12, 'CONT': 'N.America', 'IND_DAY': '1867-07-01'},
    'AUS': {'COUNTRY': 'Australia', 'POP': 25.47, 'AREA': 7_692.02,
            'GDP': 1_408.68, 'CONT': 'Oceania'},
    'KAZ': {'COUNTRY': 'Kazakhstan', 'POP': 18.53, 'AREA': 2_724.90,
            'GDP': 159.41, 'CONT': 'Asia', 'IND_DAY': '1991-12-16'}
}
```



```
columns = ('COUNTRY', 'POP', 'AREA', 'GDP', 'CONT', 'IND_DAY')
df6 = pd.DataFrame(data=data, index=columns).T
df6.to_html('data.html')
```

Output:

	COUNTRY	POP	AREA	GDP	CONT	IND_DAY
CHN	China	1398.72	9596.96	12234.78	Asia	NaN
IND	India	1351.16	3287.26	2575.67	Asia	1947-08-15
USA	US	329.74	9833.52	19485.39	N.America	1776-07-04
IDN	Indonesia	268.07	1910.93	1015.54	Asia	1945-08-17
BRA	Brazil	210.32	8515.77	2055.51	S.America	1822-09-07
PAK	Pakistan	205.71	881.91	302.14	Asia	1947-08-14
NGA	Nigeria	200.96	923.77	375.77	Africa	1960-10-01
BGD	Bangladesh	167.09	147.57	245.63	Asia	1971-03-26
RUS	Russia	146.79	17098.25	1530.75	NaN	1992-06-12
MEX	Mexico	126.58	1964.38	1158.23	N.America	1810-09-16
JPN	Japan	126.22	377.97	4872.42	Asia	NaN
DEU	Germany	83.02	357.11	3693.2	Europe	NaN
FRA	France	67.02	640.68	2582.49	Europe	1789-07-14
GBR	UK	66.44	242.5	2631.23	Europe	NaN
ITA	Italy	60.36	301.34	1943.84	Europe	NaN
ARG	Argentina	44.94	2780.4	637.49	S.America	1816-07-09
DZA	Algeria	43.38	2381.74	167.56	Africa	1962-07-05
CAN	Canada	37.59	9984.67	1647.12	N.America	1867-07-01
AUS	Australia	25.47	7692.02	1408.68	Oceania	NaN
KAZ	Kazakhstan	18.53	2724.9	159.41	Asia	1991-12-16

Task 8:- Implement columns Function

Python Code:

```
import pandas as pd
df8 = pd.read_html('data.html', index_col=0)
print(df8)
```

Output:

```
PS C:\Users\abc> & D:/DLLs/Anaconda/python.exe "d:/Aryan/Semester - 3/Programming With  
COUNTRY POP AREA GDP CONT IND_DAY  
CHN China 1398.72 9596.96 12234.78 Asia NaN  
IND India 1351.16 3287.26 2575.67 Asia 1947-08-15  
USA US 329.74 9833.52 19485.39 N.America 1776-07-04  
IDN Indonesia 268.07 1910.93 1015.54 Asia 1945-08-17  
BRA Brazil 210.32 8515.77 2055.51 S.America 1822-09-07  
PAK Pakistan 205.71 881.91 302.14 Asia 1947-08-14  
NGA Nigeria 200.96 923.77 375.77 Africa 1960-10-01  
BGD Bangladesh 167.09 147.57 245.63 Asia 1971-03-26  
RUS Russia 146.79 17098.25 1530.75 NaN 1992-06-12  
MEX Mexico 126.58 1964.38 1158.23 N.America 1810-09-16  
JPN Japan 126.22 377.97 4872.42 Asia NaN  
DEU Germany 83.02 357.11 3693.20 Europe NaN  
FRA France 67.02 640.68 2582.49 Europe 1789-07-14  
GBR UK 66.44 242.50 2631.23 Europe NaN  
ITA Italy 60.36 301.34 1943.84 Europe NaN  
ARG Argentina 44.94 2780.40 637.49 S.America 1816-07-09  
DZA Algeria 43.38 2381.74 167.56 Africa 1962-07-05  
CAN Canada 37.59 9984.67 1647.12 N.America 1867-07-01  
AUS Australia 25.47 7692.02 1408.68 Oceania NaN  
KAZ Kazakhstan 18.53 2724.90 159.41 Asia 1991-12-16
```