```
print("Welcome to Pandas-2")
```

```
     Welcome to Pandas-2
```

```
import pandas as pd
```

```
df=pd.read_csv("/Users/nikhilsanghi/Downloads/dsml-course-main-live/batches/May-Beg-Aug-Ad
```

```
# df
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1699	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1700	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1699	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1700	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
df.set_index("country",inplace=True)
```

```
df
```

country	year	population	continent	life_exp	gdp_cap
Afghanistan	1952	8425333	Asia	28.801	779.445314
Afghanistan	1957	9240934	Asia	30.332	820.853030
Afghanistan	1962	10267083	Asia	31.997	853.100710
Afghanistan	1967	11537966	Asia	34.020	836.197138
Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...
Zimbabwe	1987	9216418	Africa	62.351	706.157306
Zimbabwe	1992	10704340	Africa	60.377	693.420786

```
df.loc["Afghanistan"]
```

country	year	population	continent	life_exp	gdp_cap
Afghanistan	1952	8425333	Asia	28.801	779.445314
Afghanistan	1957	9240934	Asia	30.332	820.853030
Afghanistan	1962	10267083	Asia	31.997	853.100710
Afghanistan	1967	11537966	Asia	34.020	836.197138
Afghanistan	1972	13079460	Asia	36.088	739.981106
Afghanistan	1977	14880372	Asia	38.438	786.113360
Afghanistan	1982	12881816	Asia	39.854	978.011439
Afghanistan	1987	13867957	Asia	40.822	852.395945
Afghanistan	1992	16317921	Asia	41.674	649.341395
Afghanistan	1997	22227415	Asia	41.763	635.341351
Afghanistan	2002	25268405	Asia	42.129	726.734055
Afghanistan	2007	31889923	Asia	43.828	974.580338

```
df.loc["India"]
```

country	year	population	continent	life_exp	gdp_cap
India	1952	372000000	Asia	37.373	546.565749
India	1957	409000000	Asia	40.249	590.061996
India	1962	454000000	Asia	43.605	658.347151
India	1967	506000000	Asia	47.193	700.770611
India	1972	567000000	Asia	50.651	724.032527
India	1977	634000000	Asia	54.208	813.337323
India	1982	708000000	Asia	56.596	855.723538

```
df.iloc["India"]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
/var/folders/hd/9z4dczb56dj54lb7q8w7s4zw0000gn/T/ipykernel_52171/2391450996.py in
<module>
----> 1 df.iloc["India"]

                                 1 frames
~/opt/anaconda3/lib/python3.9/site-packages/pandas/core/indexing.py in
_getitem_axis(self, key, axis)
   1561             key = item_from_zerodim(key)
   1562             if not is_integer(key):
-> 1563                 raise TypeError("Cannot index by location index with a non-
integer key")
   1564
   1565             # validate the location

TypeError: Cannot index by location index with a non-integer key
```

```
df.reset_index(inplace=True)
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710

```
df.index=[i for i in range(1,1705)]
```

4	Afghanistan	1972	13079460	Asia	36.088	739.981106

```
df.index
```

```
RangeIndex(start=0, stop=1704, step=1)
```

```
df.index=[i for i in range(1,1705)]
```

1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960

```
df.index
```

```
Int64Index([   1,    2,    3,    4,    5,    6,    7,    8,    9,   10,
             ...
            1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704],
           dtype='int64', length=1704)
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
df.loc[3:5]
```

	country	year	population	continent	life_exp	gdp_cap
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106

```
df.loc[2]
```

```
country       Afghanistan
year                 1957
population         9240934
continent             Asia
life_exp            30.332
gdp_cap           820.85303
Name: 2, dtype: object
```

```
df.iloc[1]
```

```
country       Afghanistan
year                 1957
population         9240934
continent             Asia
life_exp            30.332
gdp_cap           820.85303
Name: 2, dtype: object
```

```
df.iloc[1:2]
```

	country	year	population	continent	life_exp	gdp_cap
2	Afghanistan	1957	9240934	Asia	30.332	820.85303

```
df.loc[1:2]
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030

```
df.loc[[2,5,1703]]
```

	country	year	population	continent	life_exp	gdp_cap
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623

```
type(df.loc[[2,5,1703]])
```

```
pandas.core.frame.DataFrame
```

```
df.loc[[2,5,1703]]
```

	country	year	population	continent	life_exp	gdp_cap
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623

```
# df.loc[rows,columns]
```

```
df.loc[[2,5,1703],["country"]]
```

	country
2	Afghanistan
5	Afghanistan
1703	Zimbabwe

```
df.loc[[2,5,1703],["country","year"]]
```

	country	year
2	Afghanistan	1957
5	Afghanistan	1972

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
# df.loc[3:5,4:6]
```

```
df.loc[3:5,"country":"population"]
```

	country	year	population
3	Afghanistan	1962	10267083
4	Afghanistan	1967	11537966
5	Afghanistan	1972	13079460

```
df.iloc[2:5,0:3]
```

	country	year	population
3	Afghanistan	1962	10267083
4	Afghanistan	1967	11537966
5	Afghanistan	1972	13079460

```
df.loc[3:10,"country":"life_exp"]
```

	country	year	population	continent	life_exp
3	Afghanistan	1962	10267083	Asia	31.997
4	Afghanistan	1967	11537966	Asia	34.020
5	Afghanistan	1972	13079460	Asia	36.088
6	Afghanistan	1977	14880372	Asia	38.438
7	Afghanistan	1982	12881816	Asia	39.854
8	Afghanistan	1987	13867957	Asia	40.822
9	Afghanistan	1992	16317921	Asia	41.674
10	Afghanistan	1997	22227415	Asia	41.763

```
df.loc[3:10,["country","year","continent"]]
```

	country	year	continent
3	Afghanistan	1962	Asia
4	Afghanistan	1967	Asia
5	Afghanistan	1972	Asia
6	Afghanistan	1977	Asia
7	Afghanistan	1982	Asia
8	Afghanistan	1987	Asia
9	Afghanistan	1992	Asia
10	Afghanistan	1997	Asia

```
df.iloc[2:10,[0,1,3]]
```

	country	year	continent
3	Afghanistan	1962	Asia
4	Afghanistan	1967	Asia
5	Afghanistan	1972	Asia
6	Afghanistan	1977	Asia
7	Afghanistan	1982	Asia
8	Afghanistan	1987	Asia
9	Afghanistan	1992	Asia
10	Afghanistan	1997	Asia

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
df.iloc[[1702,1,98],[4,5,3]]
```

	life_exp	gdp_cap	continent
1703	39.989	672.038623	Africa
2	30.332	820.853030	Asia
99	41.216	686.341554	Asia

```
df.iloc[[1702,1,98],-3:]
```

	continent	life_exp	gdp_cap
1703	Africa	39.989	672.038623
2	Asia	30.332	820.853030
99	Asia	41.216	686.341554

```
# df.loc[[1703,2,99],-3:]
```

```
df.iloc[[1702,1,98],[-2,-3,-1]]
```

	life_exp	continent	gdp_cap
1703	39.989	Africa	672.038623

```
df.loc[[1703,2,99],-3:]
```

```
df.iloc[-10:,-3:]
```

	continent	life_exp	gdp_cap
1695	Africa	52.358	527.272182
1696	Africa	53.995	569.795071
1697	Africa	55.635	799.362176
1698	Africa	57.674	685.587682
1699	Africa	60.363	788.855041
1700	Africa	62.351	706.157306
1701	Africa	60.377	693.420786
1702	Africa	46.809	792.449960
1703	Africa	39.989	672.038623
1704	Africa	43.487	469.709298

```
df.loc[10:20:2,"country":"gdp_cap":2]
```

	country	population	life_exp
10	Afghanistan	22227415	41.763
12	Afghanistan	31889923	43.828
14	Albania	1476505	59.280
16	Albania	1984060	66.220
18	Albania	2509048	68.930
20	Albania	3075321	72.000

```
df.iloc[9:21:2,0:4:2]
```

	country	population
10	Afghanistan	22227415

```
# How to select records from 30th to 40th row
# for the last 3 columns using iloc?
# df.iloc[29:40,-3:]  #correct
# df.iloc[30:39,-3:]
# df.iloc[31:41,-3:]
# df.iloc[29:39,-3:]
```

```
#adding a row
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
#append
dictionary={"country":"Zimbabwe",
           "year":2012,
           "population":22311143,
           "continent":"Africa",
           "life_exp":45.8,
           "gdp_cap":500.54543534}
df=df.append(dictionary)
df
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
/var/folders/hd/9z4dczb56dj54lb7q8w7s4zw0000gn/T/ipykernel_52171/4170495422.py in
<module>
      6            "life_exp":45.8,
      7            "gdp_cap":500.54543534}
----> 8 df=df.append(dictionary)
      9 df

~/opt/anaconda3/lib/python3.9/site-packages/pandas/core/frame.py in append(self,
other, ignore_index, verify_integrity, sort)
   8929             if isinstance(other, dict):
   8930                 if not ignore_index:
-> 8931                     raise TypeError("Can only append a dict if
```

```
df.append?
```

```
   8933             if other.name is None and not ignore_index:
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1699	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1700	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
#append
dictionary={"country":"Zimbabwe",
          "year":2012,
```

```
            "population":22311143,
            "continent":"Africa",
            "life_exp":45.8,
            "gdp_cap":500.54543534}
df=df.append(dictionary,ignore_index=True)
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	Zimbabwe	2012	22311143	Africa	45.800	500.545435

1705 rows × 6 columns

```
len(df.index)
```

```
1705
```

```
df.loc[len(df.index)]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	Zimbabwe	2012	22311143	Africa	45.800	500.545435
1705	India	2022	130000000	Asia	60.654	5000.765000

1706 rows × 6 columns

```
df.loc[len(df.index)]
```

```
df.index
```

```
Int64Index([   0,    1,    2,    3,    4,    5,    6,    7,    8,    9,
            ...
            1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705],
           dtype='int64', length=1706)
```

```
df.loc[len(df.index)]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298

```
df.loc[1707]=["India",2022,130000000,"Asia",60.654,5000.765]
```

1705	India	2022	130000000	Asia	60.654	5000.765000

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	Zimbabwe	2012	22311143	Africa	45.800	500.545435
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000

1708 rows × 6 columns

```
df.loc[1703]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1703	India	2022	130000000	Asia	60.654	5000.765000
1704	Zimbabwe	2012	22311143	Africa	45.800	500.545435

```
df.loc[9999]=["India",2022,130000000,"Asia",60.654,5000.765]
```

1706 India 2022 130000000 Asia 60.654 5000.765000

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	India	2022	130000000	Asia	60.654	5000.765000
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000

1708 rows × 6 columns

```
df.loc[1708]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000

```
df.index
```

```
Int64Index([   0,    1,    2,    3,    4,    5,    6,    7,    8,    9,
            ...
            1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 9999, 1708],
           dtype='int64', length=1710)
```

```
df.loc["1720"]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1706	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000
9999	India	2022	130000000	Asia	60.654	5000.765000
1708	India	2022	130000000	Asia	60.654	5000.765000
1720	India	2022	130000000	Asia	60.654	5000.765000

1711 rows × 6 columns

```
df.index
```

```
Index([     0,      1,      2,      3,      4,      5,      6,      7,      8,
            9,
```

```
       ...
         1701,   1702,   1703,   1704,   1705,   1706,   1707,   9999,   1708,
       '1720'],
      dtype='object', length=1711)
```

```
df.iloc[1721]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
/var/folders/hd/9z4dczb56dj54lb7q8w7s4zw0000gn/T/ipykernel_52171/2427488946.py in
<module>
----> 1 df.iloc[1721]=["India",2022,130000000,"Asia",60.654,5000.765]

                                 1 frames
~/opt/anaconda3/lib/python3.9/site-packages/pandas/core/indexing.py in
_has_valid_setitem_indexer(self, indexer)
   1459             elif is_integer(i):
   1460                 if i >= len(ax):
-> 1461                     raise IndexError("iloc cannot enlarge its target
object")
   1462             elif isinstance(i, dict):
   1463                 raise IndexError("iloc cannot enlarge its target object")

IndexError: iloc cannot enlarge its target object
```

```
df.drop(1706,axis=0,inplace=True)
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	India	2022	130000000	Asia	60.654	5000.765000
1705	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000

1707 rows × 6 columns

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	India	2022	130000000	Asia	60.654	5000.765000
1705	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000

1707 rows × 6 columns

```
df.iloc[1702]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1702	India	2022	130000000	Asia	60.654	5000.765000
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298
1704	India	2022	130000000	Asia	60.654	5000.765000
1705	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000

1707 rows × 6 columns

```
pd.read_csv?
```

```
df.index
```

```
Int64Index([   0,    1,    2,    3,    4,    5,    6,    7,    8,    9,
            ...
            1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1707],
           dtype='int64', length=1707)
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
0	Afghanistan	1952	8425333	Asia	28.801	779.445314
1	Afghanistan	1957	9240934	Asia	30.332	820.853030
2	Afghanistan	1962	10267083	Asia	31.997	853.100710
3	Afghanistan	1967	11537966	Asia	34.020	836.197138
4	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1699	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1700	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1701	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1702	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1703	Zimbabwe	2007	12311143	Africa	43.487	469.709298

1704 rows × 6 columns

```
df.index=[i for i in range(1,1705)]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710

```
df.loc[len(df.index)]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	India	2022	130000000	Asia	60.654	5000.765000

1704 rows × 6 columns

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314

```
df.loc[len(df.index)]=["India",2022,130000000,"Asia",60.654,5000.765]
```

3	Afghanistan	1962	10267083	Asia	31.997	853.100710

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	India	2022	130000000	Asia	60.654	5000.765000

1704 rows × 6 columns

```
df.loc[len(df.index)]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314

```
len(df)
```

```
1704
```

```
df.loc[1705]=["India",2022,130000000,"Asia",60.654,5000.765]
```

	...	...	...	...	...	...

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	Zimbabwe	1997	11404948	Africa	46.809	792.449960
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1704	India	2022	130000000	Asia	60.654	5000.765000
1705	India	2022	130000000	Asia	60.654	5000.765000

1705 rows × 6 columns

```
df.loc[1702]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138

```
df.drop(1704,axis=0,inplace=True)
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	India	2022	130000000	Asia	60.654	5000.765000
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1705	India	2022	130000000	Asia	60.654	5000.765000

1704 rows × 6 columns

```
df.loc[1706]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df.loc[1707]=["India",2022,130000000,"Asia",60.654,5000.765]
```

```
df
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1702	India	2022	130000000	Asia	60.654	5000.765000
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000

```
df.loc[1708]=["Sri Lanka",2022,130000000,"Asia",80,500]
```

```
df.loc[1709]=["Sri Lanka",2022,130000000,"Asia",80,500]
```

```
df.tail(10)
```

	country	year	population	continent	life_exp	gdp_cap
1699	Zimbabwe	1982	7636524	Africa	60.363	788.855041
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	India	2022	130000000	Asia	60.654	5000.765000
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000
1708	Sri Lanka	2022	130000000	Asia	80.000	500.000000
1709	Sri Lanka	2022	130000000	Asia	80.000	500.000000

```
df.loc[1710]=["India",2022,130000000,"Asia",80,5000.765]
```

```
df.tail(10)
```

	country	year	population	continent	life_exp	gdp_cap
1700	Zimbabwe	1987	9216418	Africa	62.351	706.157306
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1702	India	2022	130000000	Asia	60.654	5000.765000
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1705	India	2022	130000000	Asia	60.654	5000.765000
1706	India	2022	130000000	Asia	60.654	5000.765000
1707	India	2022	130000000	Asia	60.654	5000.765000
1708	Sri Lanka	2022	130000000	Asia	80.000	500.000000

```
df.duplicated().tail(10)
```

```
1700    False
1701    False
1702    False
1703    False
1705     True
1706     True
1707     True
1708    False
1709     True
1710    False
dtype: bool
```

```
df.loc[df.duplicated()]
```

	country	year	population	continent	life_exp	gdp_cap
1705	India	2022	130000000	Asia	60.654	5000.765
1706	India	2022	130000000	Asia	60.654	5000.765
1707	India	2022	130000000	Asia	60.654	5000.765
1709	Sri Lanka	2022	130000000	Asia	80.000	500.000

```
df.drop_duplicates(keep="first")
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106

```
df.drop_duplicates(keep="last")
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030
3	Afghanistan	1962	10267083	Asia	31.997	853.100710
4	Afghanistan	1967	11537966	Asia	34.020	836.197138
5	Afghanistan	1972	13079460	Asia	36.088	739.981106
...	...	...	...	...	...	...
1701	Zimbabwe	1992	10704340	Africa	60.377	693.420786
1703	Zimbabwe	2002	11926563	Africa	39.989	672.038623
1707	India	2022	130000000	Asia	60.654	5000.765000
1709	Sri Lanka	2022	130000000	Asia	80.000	500.000000
1710	India	2022	130000000	Asia	80.000	5000.765000

1705 rows × 6 columns

```
df.drop_duplicates(keep=False)
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
2	Afghanistan	1957	9240934	Asia	30.332	820.853030

```
df.drop_duplicates(subset=["country"],keep="first")
```

	country	year	population	continent	life_exp	gdp_cap
1	Afghanistan	1952	8425333	Asia	28.801	779.445314
13	Albania	1952	1282697	Europe	55.230	1601.056136
25	Algeria	1952	9279525	Africa	43.077	2449.008185
37	Angola	1952	4232095	Africa	30.015	3520.610273
49	Argentina	1952	17876956	Americas	62.485	5911.315053
...	...	...	...	...	...	...
1645	Vietnam	1952	26246839	Asia	40.412	605.066492
1657	West Bank and Gaza	1952	1030585	Asia	43.160	1515.592329
1669	Yemen, Rep.	1952	4963829	Asia	32.548	781.717576
1681	Zambia	1952	2672000	Africa	42.038	1147.388831
1693	Zimbabwe	1952	3080907	Africa	48.451	406.884115

142 rows × 6 columns