In [1]:
```
import pandas as pd
internal1 = {'s1':21,'s2':24,'s3':45}
internal1=pd.Series(internal1)
internal1
```

Out[1]:
```
s1    21
s2    24
s3    45
dtype: int64
```

In [2]:
```
internal2 = {'d1':23,'d2':45,'d3':12}
internal = {'Internal1':internal1,'Internal2':internal2}
internal = pd.DataFrame(internal)
internal
```

Out[2]:

	Internal1	Internal2
d1	NaN	23.0
d2	NaN	45.0
d3	NaN	12.0
s1	21.0	NaN
s2	24.0	NaN
s3	45.0	NaN

In [5]:
```
internal3 = {'f1':89,'f2':91,'f3':80}
internal = {'Internal1':internal1,'Internal2':internal2,'Internal3':internal
internal=pd.DataFrame(internal)
internal
```

Out[5]:

	Internal1	Internal2	Internal3
d1	NaN	23.0	NaN
d2	NaN	45.0	NaN
d3	NaN	12.0	NaN
f1	NaN	NaN	89.0
f2	NaN	NaN	91.0
f3	NaN	NaN	80.0
s1	21.0	NaN	NaN
s2	24.0	NaN	NaN
s3	45.0	NaN	NaN

In [6]:
```
internal3 = pd.Series(internal3)
internal3
```

Out[6]:
```
f1    89
f2    91
f3    80
dtype: int64
```

In [8]:
```
internal.columns
```

Out[8]:
```
Index(['Internal1', 'Internal2', 'Internal3'], dtype='object')
```

In [9]:
```
internal.values
```

Out[9]:
```
array([[nan, 23., nan],
       [nan, 45., nan],
       [nan, 12., nan],
       [nan, nan, 89.],
       [nan, nan, 91.],
       [nan, nan, 80.],
       [21., nan, nan],
       [24., nan, nan],
       [45., nan, nan]])
```

In [10]:
```
internal.values[3]
```

Out[10]:
```
array([nan, nan, 89.])
```

In [14]:
```
internal.values[2,1]   # Acessing the 2rd row 1st column value
```

Out[14]:
```
12.0
```

In [17]:
```
internal.values[2][1]
```

Out[17]:
```
12.0
```

In [20]:
```
for row in internal.values:
    print('internal1 -',row[0],'internal2 - ',row[1],'internal3 -',row[2])
```

```
internal1 - nan internal2 -  23.0 internal3 - nan
internal1 - nan internal2 -  45.0 internal3 - nan
internal1 - nan internal2 -  12.0 internal3 - nan
internal1 - nan internal2 -  nan internal3 - 89.0
internal1 - nan internal2 -  nan internal3 - 91.0
internal1 - nan internal2 -  nan internal3 - 80.0
internal1 - 21.0 internal2 -  nan internal3 - nan
internal1 - 24.0 internal2 -  nan internal3 - nan
internal1 - 45.0 internal2 -  nan internal3 - nan
```

In [21]:
```
inter1={'s1':23,'s2':45,'s3':46}
inter2={'s1':34,'s2':30,'s3':25}
inter = {'Inter1':inter1,'Inter2':inter2}
inter=pd.DataFrame(inter)
inter
```

Out[21]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25

In [22]:
```
for row in inter.values:
    print('Inter1 -',row[0],'Inter2 -',row[1])
```

```
Inter1 - 23 Inter2 - 34
Inter1 - 45 Inter2 - 30
Inter1 - 46 Inter2 - 25
```

In [23]:
```
inter
```

Out[23]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25

In [24]:
```
inter.loc['s4']=[19,91]
```

In [25]:
```
inter
```

Out[25]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25
s4	19	91

In [26]:
```
inter.loc['3']=[89,90]
```

In [27]:
```
1 inter
```

Out[27]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25
s4	19	91
3	89	90

In [29]:
```
1 inter.drop('3')
```

Out[29]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25
s4	19	91

In [30]:
```
1 inter.drop('s4')
```

Out[30]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25
3	89	90

In [34]:
```
1 inter=inter.drop('s4')
```

In [35]:
```
1 inter
```

Out[35]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25

In [38]:
```
1 inter.loc['s4']=[23,67]
2 inter
```

Out[38]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25
s4	23	67

In [40]:
```
1 inter =inter.drop('s4')
2 inter
```

Out[40]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25

In [41]:
```
1 inter
```

Out[41]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	25

In [45]:
```
1 inter.values[2,1]=78
```

In [46]:
```
1 inter
```

Out[46]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	46	78

In [47]:
```
1 inter.values[2]=[35,85]
2 inter
```

Out[47]:

	Inter1	Inter2
s1	23	34
s2	45	30
s3	35	85

In [50]:
```
# Reading a CSV file
import pandas as pd
filepath='DataFiles/pandaa.csv'
incomedf=pd.read_csv(filepath)
incomedf
```

Out[50]:

	GEOID	State	2005	2006	2007	2008	2009	2010	2011	2012	2013
0	04000US01	Alabama	37150	37952	42212	44476	39980	40933	42590	43464	41381
1	04000US02	Alaska	55891	56418	62993	63989	61604	57848	57431	63648	61137
2	04000US04	Arizona	45245	46657	62993	46914	45739	46896	48621	47044	50602
3	04000US05	Arkansas	36658	37057	40795	39586	36538	38587	41302	39018	39919
4	04000US06	California	51755	55319	55734	57014	56134	54283	53367	57020	57528

In [51]:
```
# Function to read CSV data into a DataFrame and
# Return the DataFrame object
def readCSVdata(filepath):
    return pd.read_csv(filepath)

filepath='DataFiles/Income.csv'
readCSVdata(filepath)
```

Out[51]:

	GEOID	State	2005	2006	2007	2008	2009	2010	2011	2012	2013
0	04000US01	Alabama	37150	37952	42212	44476	39980	40933	42590	43464	41381
1	04000US02	Alaska	55891	56418	62993	63989	61604	57848	57431	63648	61137
2	04000US04	Arizona	45245	46657	62993	46914	45739	46896	48621	47044	50602
3	04000US05	Arkansas	36658	37057	40795	39586	36538	38587	41302	39018	39919
4	04000US06	California	51755	55319	55734	57014	56134	54283	53367	57020	57528

In [53]:
```
incomedf=readCSVdata(filepath)

# Function to print all the colums
# GEOID State 2005 2006 2007 2008 2009 2010 2011 2012 2013

def columns(df):
    col=df.columns
    for col in df.columns:
        print(col,end=' ')
    return
columns(incomedf)
```

```
GEOID State 2005 2006 2007 2008 2009 2010 2011 2012 2013
```

In [ ]:
```

```