In [ ]:
```
1
```

In [1]:
```
# Function to read CSV data into a DataFrame and
# Return the DataFrame object
filepath = 'DataFiles/Income.csv'
import pandas as pd
def readCSVdata(filepath):
    return pd.read_csv(filepath)
readCSVdata(filepath)
```

Out[1]:

	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	47215	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 [2]:
```
incomedf =readCSVdata(filepath)

# Function to print all columns in a single line

# GEOID State 2005 2006 2007 2008 2009 2010 2011 2013 2014

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

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

In [3]:
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1
incomedf.values
```

Out[3]:
```
array([['04000US01', 'Alabama', 37150, 37952, 42212, 44476, 39980, 40933,
        42590, 43464, 41381],
       ['04000US02', 'Alaska', 55891, 56418, 62993, 63989, 61604, 57848,
        57431, 63648, 61137],
       ['04000US04', 'Arizona', 45245, 46657, 47215, 46914, 45739, 46896,
        48621, 47044, 50602],
       ['04000US05', 'Arkansas', 36658, 37057, 40795, 39586, 36538,
        38587, 41302, 39018, 39919],
       ['04000US06', 'California', 51755, 55319, 55734, 57014, 56134,
        54283, 53367, 57020, 57528]], dtype=object)
```

In [7]:
```
#Function to access a row based on a unique column value (here it is state)
def  accessDataFrameRow(df,key):
    values=df.values
    for row in values:
        if key in row:
            for item in row:
                print(item,end=' ')
    return
accessDataFrameRow(incomedf,'Alaska')
```

```
04000US02 Alaska 55891 56418 62993 63989 61604 57848 57431 63648 61137
```

In [6]:
```
# Our Key will be anything from our needed row
def  accessDataFrameRow(df,key):
    values=df.values
    for row in values:
        if key in row:
            for item in row:
                print(item,end=' ')
    return
accessDataFrameRow(incomedf,'04000US02')
```

```
04000US02 Alaska 55891 56418 62993 63989 61604 57848 57431 63648 61137
```

In [9]:
```
incomedf.index
```

Out[9]:
```
RangeIndex(start=0, stop=5, step=1)
```

In [13]:
```
# Accessing a unique value based on row, column information
# Income of a state in a given year
def valueFromRowColumn(df,rowkey,columnkey):
    for i in range(len(df.values)):
        if df.values[i][0]==rowkey or df.values[i][1]:
            rowindex = i
    for i in range(len(df.columns)):
        if df.columns[i] == columnkey:
            columnindex = i
    return df.values[rowindex][columnindex]


valueFromRowColumn(incomedf,'California','2009')

```

Out[13]:
```
56134
```

In [ ]:
```
# Function to update data based on rowkey and columnkey
def updateDataFromRowColumn(df,rowkey):
    for i in range(len(df.values)):
        if df.values[i][0] == rowkey or df.values[i][1]:
            rowindex = i
    return rowindex
def getColumnIndex(df,columnkey):
    for i in range(len(df.columns)):
        if df.columns[i]=

def valueFromRowColumn(df,rowkey,columnkey):
    for i in range(len(df.values)):
        if df.values[i][0]==rowkey or df.values[i][1]:
            rowindex = i
    for i in range(len(df.columns)):
        if df.columns[i] == columnkey:
            columnindex = i
    return df.values[rowindex][columnindex]


valueFromRowColumn(incomedf,'California','2009')

```

In [ ]:
```
# Function to update data based on rowkey and columnkey

def updateDataFromRowColumn(df,rowkey,columnkey)
```

In [ ]:
```

```

In [ ]:
```
# Function to write DataFrame to CSV

incomedf.to_csv(filepath, index = False)
```

In [ ]:
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In [ ]:
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