

## Working with Dates in Pandas

```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from IPython.core.interactiveshell import InteractiveShell
InteractiveShell.ast_node_interactivity = "all"
%matplotlib inline
```

```
In [2]: person = pd.DataFrame({'Name': ['Asif' , 'Basit' , 'John', 'Hary'],
                                'DOB': ['3/20/1960', '3/19/1981', '9/12/1999' , '7/12/1967'],
                                'EmpID': ['E453', 'E983', 'E675', 'E120']})

person
person.dtypes
```

Out[2]:

	Name	DOB	EmpID
0	Asif	3/20/1960	E453
1	Basit	3/19/1981	E983
2	John	9/12/1999	E675
3	Hary	7/12/1967	E120

Out[2]: Name object  
DOB object  
EmpID object  
dtype: object

```
In [3]: # Change the datatype of the column to Datetime
person['DOB']=pd.to_datetime(person['DOB'])
person.dtypes
person
```

Out[3]: Name object  
DOB datetime64[ns]  
EmpID object  
dtype: object

Out[3]:

	Name	DOB	EmpID
0	Asif	1960-03-20	E453
1	Basit	1981-03-19	E983
2	John	1999-09-12	E675
3	Hary	1967-07-12	E120

```
In [4]: # Extract Month , Day , Year , 'Day of Week' and 'Week of Year' from the Date field
person['Month'] = person.DOB.dt.month
person['Day'] = person.DOB.dt.day
person['Year'] = person.DOB.dt.year
person['Week Number'] =person.DOB.dt.isocalendar().week
person['Day Of Week'] = person.DOB.dt.dayofweek
person['Day Name']=pd.to_datetime(person['DOB']).dt.day_name()
person['Month Name']=pd.to_datetime(person['DOB']).dt.month_name()
person
```

Out[4]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
0	Asif	1960-03-20	E453	3	20	1960	11	6	Sunday	March
1	Basit	1981-03-19	E983	3	19	1981	12	3	Thursday	March
2	John	1999-09-12	E675	9	12	1999	36	6	Sunday	September
3	Hary	1967-07-12	E120	7	12	1967	28	2	Wednesday	July



In [5]:

```
# Changing Datetime format to '%d/%m/%Y' using strftime()
person['DOB']=pd.to_datetime(person['DOB']).dt.strftime('%d/%m/%Y') # Note : This will change the datatype back to object
person
person.dtypes
```

Out[5]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
0	Asif	20/03/1960	E453	3	20	1960	11	6	Sunday	March
1	Basit	19/03/1981	E983	3	19	1981	12	3	Thursday	March
2	John	12/09/1999	E675	9	12	1999	36	6	Sunday	September
3	Hary	12/07/1967	E120	7	12	1967	28	2	Wednesday	July

Out[5]:

```
Name          object
DOB           object
EmpID         object
Month         int64
Day           int64
Year          int64
Week Number   UInt32
Day Of Week   int64
Day Name      object
Month Name    object
dtype: object
```

In [6]:

```
# Changing Datetime format to '%m-%d-%Y' using strftime()
person['DOB']=pd.to_datetime(person['DOB']).dt.strftime('%m-%d-%Y') # Note : This will change the datatype back to object
person
person.dtypes
```

Out[6]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
0	Asif	03-20-1960	E453	3	20	1960	11	6	Sunday	March
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September
3	Hary	12-07-1967	E120	7	12	1967	28	2	Wednesday	July

Out[6]:

```
Name          object
DOB           object
EmpID         object
Month         int64
Day           int64
Year          int64
Week Number   UInt32
Day Of Week   int64
Day Name      object
Month Name    object
dtype: object
```

In [7]:

```
# Find employees who are born after 12-20-1980
from datetime import date
person[pd.to_datetime(person['DOB']) > pd.Timestamp(date(1980,12,20))]
```

Out[7]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September

In [8]:

```
# Find employees who are born after 12-20-1980
from datetime import date
person[pd.to_datetime(person['DOB']) > pd.Timestamp('1980/12/20')]
```

Out[8]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September

In [9]:

```
# Find all records where DOB is between "12-20-1980" - "12-20-2000"
from datetime import date
person[(pd.to_datetime(person['DOB']) > pd.Timestamp(date(1980,12,20))) &
      (pd.to_datetime(person['DOB']) < pd.Timestamp(date(2000,12,20)))]
```

Out[9]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September

In [10]:

```
# Min Date in a dataframe column
pd.to_datetime(person['DOB']).min()
```

Out[10]:

```
Timestamp('1960-03-20 00:00:00')
```

In [11]:

```
# Max Date in a dataframe column
pd.to_datetime(person['DOB']).max()
```

Out[11]: Timestamp('1999-12-09 00:00:00')

In [12]:

```
# Current timestamp
timestamp = pd.to_datetime('now')
print('Timestamp :{}'.format(timestamp))

# Current Date (Today)
current_date=pd.to_datetime('now').date()
print('Current Date : {}'.format(current_date))

# Yesterday
yesterday = pd.to_datetime('now').date()- pd.Timedelta('1 day')
print('Yesterday: {}'.format(yesterday))

# tomorrow
tomorrow = pd.to_datetime('now').date() + pd.Timedelta('1 day')
print('Tomorrow: {}'.format(tomorrow))
#OR
tomorrow = pd.to_datetime('now').date() + pd.DateOffset(days=1)
print('Tomorrow: {}'.format(tomorrow))

#Add Business Day to current date
add_buss_day=pd.to_datetime('now').date()+pd.offsets.BDay(1)
print('Date after adding Business Day: {}'.format(add_buss_day)) # Saturday & Sunday will be excluded

#Add 1 month to current date
add_month=pd.to_datetime('now').date()+pd.DateOffset(months=1)
print('Date after adding 1 month to current date: {}'.format(add_month))

# Date Difference in hours
diff_hrs= (pd.to_datetime('2021-03-26 21:11:13') - pd.to_datetime('2021-03-01 11:11:13')).total_seconds()//3600
print('Date Difference in hours: {}'.format(diff_hrs))
```

Timestamp :2021-03-26 22:17:00.173312  
Current Date : 2021-03-26  
Yesterday: 2021-03-25  
Tomorrow: 2021-03-27  
Tomorrow: 2021-03-27 00:00:00  
Date after adding Business Day: 2021-03-29 00:00:00  
Date after adding 1 month to current date: 2021-04-26 00:00:00  
Date Difference in hours: 610.0

In [13]:

```
# Age of the person (Extract year from current time and subtract from Year column)
person['Age'] = pd.to_datetime('now').year - person['Year']
person

# OR
person['Age'] = pd.to_datetime('now').year - pd.to_datetime(person['DOB']).dt.year
person
```

Out[13]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name	Age
0	Asif	03-20-1960	E453	3	20	1960	11	6	Sunday	March	61
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March	40
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September	22
3	Hary	12-07-1967	E120	7	12	1967	28	2	Wednesday	July	54

Out[13]:

	Name	DOB	EmpID	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name	Age
0	Asif	03-20-1960	E453	3	20	1960	11	6	Sunday	March	61
1	Basit	03-19-1981	E983	3	19	1981	12	3	Thursday	March	40
2	John	12-09-1999	E675	9	12	1999	36	6	Sunday	September	22
3	Hary	12-07-1967	E120	7	12	1967	28	2	Wednesday	July	54

```
In [14]: # Lets work on simple dataset (Female birth Dataset)
# The source of the dataset is credited to Newton (1988).
female = pd.read_csv('https://raw.githubusercontent.com/jbrownlee/Datasets/master/daily-total-female-births.csv')
female.head(10)

Out[14]:
```

	Date	Births
0	1959-01-01	35
1	1959-01-02	32
2	1959-01-03	30
3	1959-01-04	31
4	1959-01-05	44
5	1959-01-06	29
6	1959-01-07	45
7	1959-01-08	43
8	1959-01-09	38
9	1959-01-10	27

```
In [15]: # Find min & max date to get the date range
pd.to_datetime(female['Date']).max()-pd.to_datetime(female['Date']).min() # This is one year of dataset that we need to

Out[15]: Timedelta('364 days 00:00:00')
```

```
In [16]: # Change datatype of Date column to Datetime
female['Date'] = pd.to_datetime(female['Date'])

In [17]: # Create helper columns
female['Month'] = female.Date.dt.month
female['Day'] = female.Date.dt.day
female['Year'] = female.Date.dt.year
female['Week Number'] =female.Date.dt.isocalendar().week
female['Day Of Week'] = female.Date.dt.dayofweek
female['Day Name']=pd.to_datetime(female['Date']).dt.day_name()
female['Month Name']=pd.to_datetime(female['Date']).dt.month_name()

# OR We can use below lines of code as well
female['Month'] = female.Date.apply(lambda x:x.month)
female['Day'] = female.Date.apply(lambda x:x.day)
female['Year'] = female.Date.apply(lambda x:x.year)
female['Week Number'] =female.Date.apply(lambda x:x.week)
female['Day Of Week'] = female.Date.apply(lambda x:x.dayofweek)
female['Day Name']=pd.to_datetime(female['Date']).apply(lambda x:x.day_name())
female['Month Name']=pd.to_datetime(female['Date']).apply(lambda x:x.month_name())

female.head()
```

Out[17]:

	Date	Births	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
0	1959-01-01	35	1	1	1959	1	3	Thursday	January
1	1959-01-02	32	1	2	1959	1	4	Friday	January
2	1959-01-03	30	1	3	1959	1	5	Saturday	January
3	1959-01-04	31	1	4	1959	1	6	Sunday	January
4	1959-01-05	44	1	5	1959	2	0	Monday	January

```
In [18]: # Total female births in the month of January
female[female['Month Name'] == 'January']['Births'].sum()

Out[18]: 1213
```

```
In [19]: # Total female births in each month using for Loop
for i in female['Month Name'].unique():
    print('Female births in {0} : {1}'.format(i,female[female['Month Name'] ==i]['Births'].sum()))

Female births in January : 1213
Female births in February : 1148
Female births in March : 1218
Female births in April : 1195
Female births in May : 1208
Female births in June : 1212
Female births in July : 1300
Female births in August : 1351
Female births in September : 1446
Female births in October : 1368
Female births in November : 1350
Female births in December : 1314
```

```
In [20]: # Using "group by" to get female births in each month
female.groupby('Month Name').sum()[['Births']] # MonthName column data is not in ascending order.
```

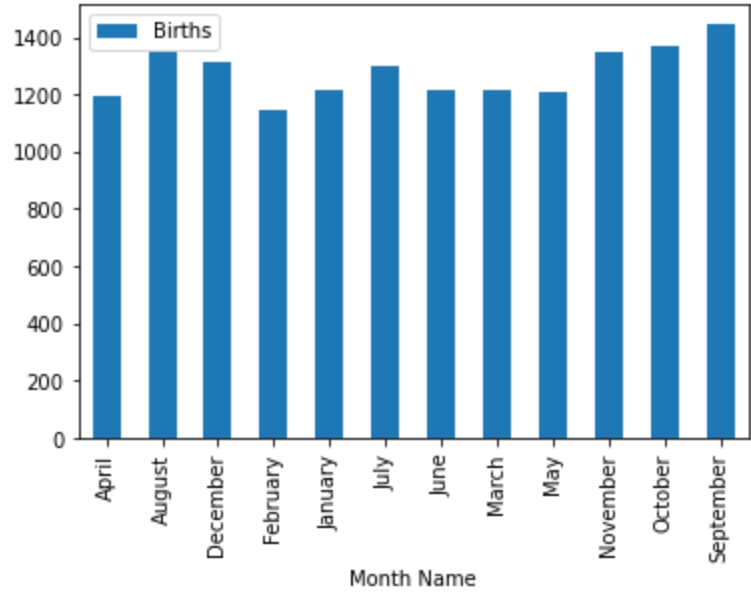
```
Out[20]:
```

Births	
Month Name	
April	1195
August	1351
December	1314
February	1148
January	1213
July	1300
June	1212
March	1218
May	1208
November	1350
October	1368
September	1446

```
In [21]: # Use Pivot table to get female births in each month
pd.pivot_table(female,values=['Births'],index=['Month Name'],aggfunc=np.sum) # Month Name data is not in proper order.
pd.pivot_table(female,values=['Births'],index=['Month Name'],aggfunc=np.sum).plot.bar()
```



Out[21]: <AxesSubplot:xlabel='Month Name'>



```
In [22]: # We will convert "Month Name" column into Categorical variable and specify the ordering
order = ['January', 'February', 'March', 'April', 'May', 'June',
        'July', 'August', 'September', 'October', 'November', 'December']

female['Month Name']=pd.Categorical(female['Month Name'],order)
```

In [23]: `female.groupby('Month Name').sum()[['Births']] # Now the output is much better after custom ordering`

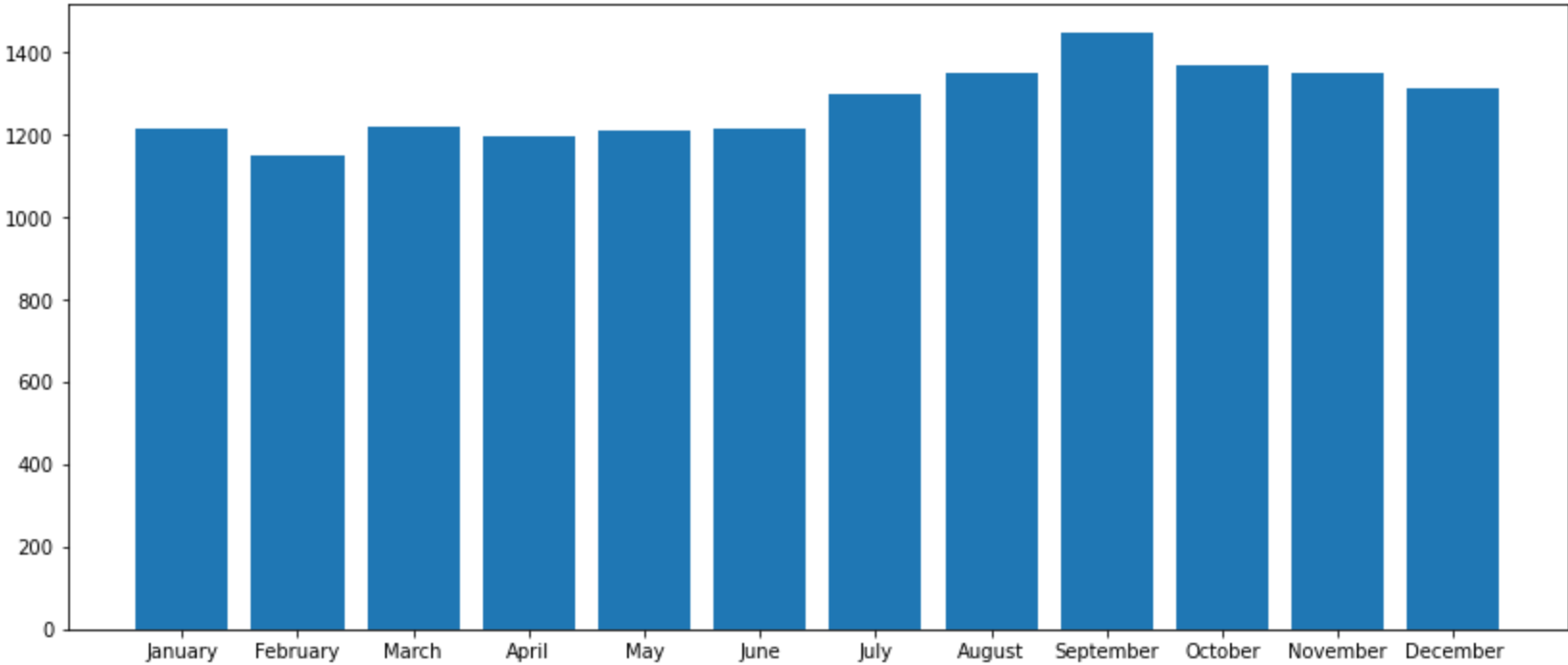
Out[23]:

Births	
Month Name	
January	1213
February	1148
March	1218
April	1195
May	1208
June	1212
July	1300
August	1351
September	1446
October	1368
November	1350
December	1314

In [24]: `# Bar plot to get monthly female births using matplotlib library  
plt.figure(figsize=(14,6))  
plt.bar(female.groupby('Month Name').sum().index,female.groupby('Month Name').sum()['Births'])  
plt.show()`

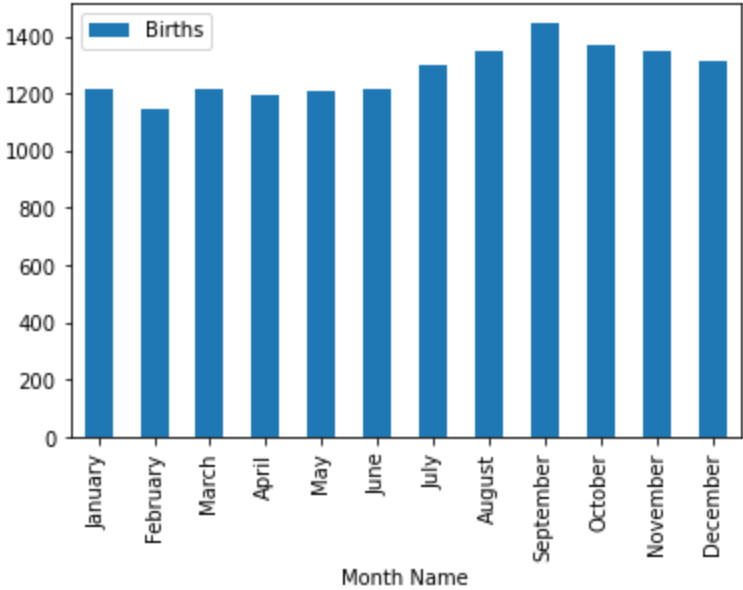
Out[24]: <Figure size 1008x432 with 0 Axes>

Out[24]: <BarContainer object of 12 artists>



In [25]: `# Bar plot to get monthly female births using Pandas  
pd.pivot_table(female,values=['Births'],index=['Month Name'],aggfunc=np.sum).plot.bar()`

Out[25]: <AxesSubplot:xlabel='Month Name'>



```
In [26]: # Same way we can implement custom ordering for Day Name field
order=[ 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday']
female['Day Name']=pd.Categorical(female['Day Name'],order)
female.groupby('Day Name').sum()[['Births']]
```

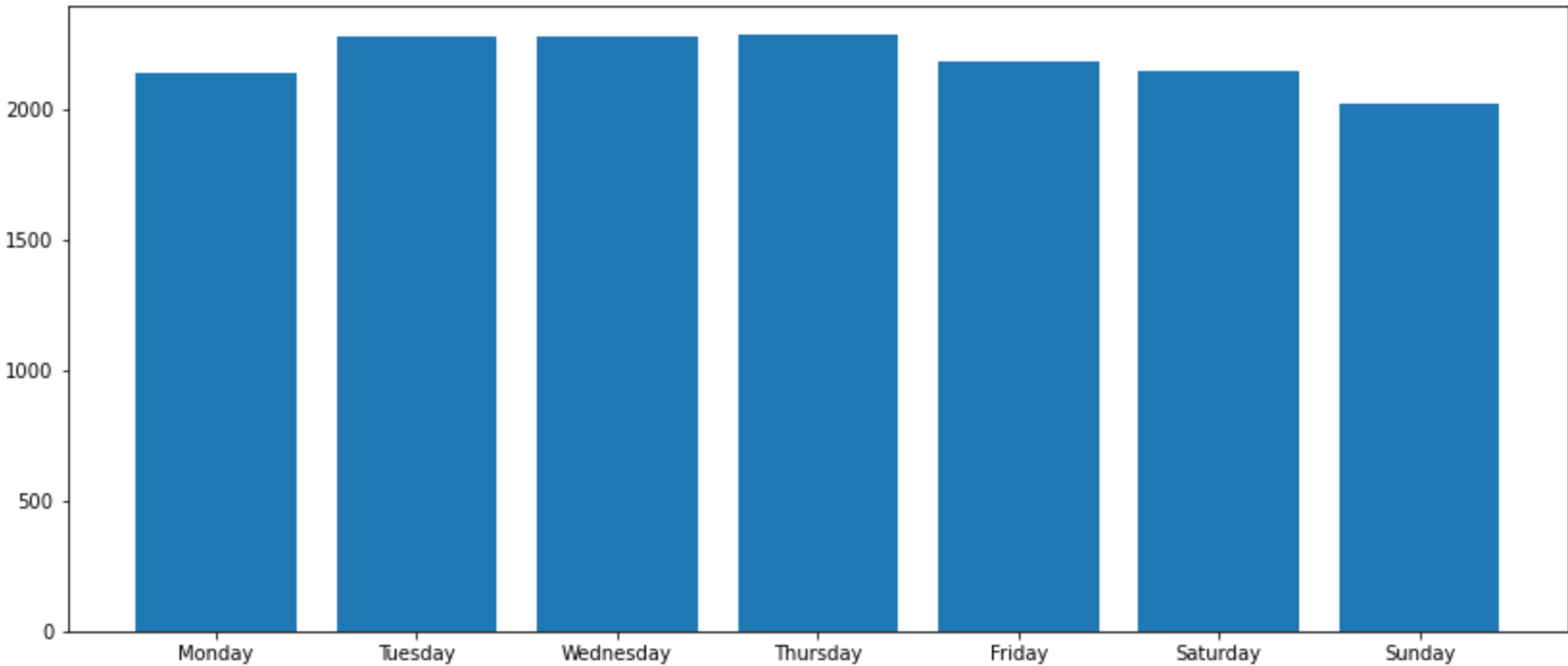
Out[26]:

	Births
Day Name	
Monday	2139
Tuesday	2275
Wednesday	2280
Thursday	2283
Friday	2182
Saturday	2142
Sunday	2022

```
In [27]: # Plot Bar Graph to show female births on day basis.
plt.figure(figsize=(14,6))
plt.bar(female.groupby('Day Name').sum().index,female.groupby('Day Name').sum()['Births'])
plt.show()
```

Out[27]: <Figure size 1008x432 with 0 Axes>

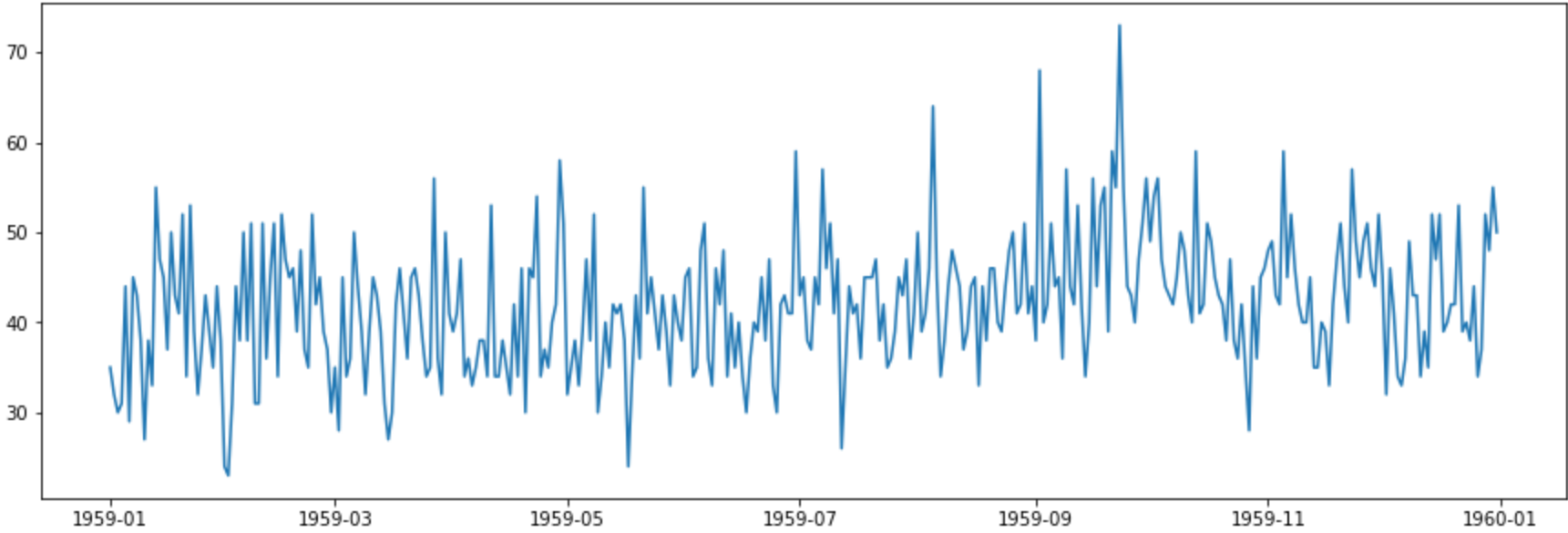
Out[27]: <BarContainer object of 7 artists>



```
In [28]: # Daily female births
plt.figure(figsize=(15,5))
plt.plot(female['Date'],female['Births'])
```

Out[28]: <Figure size 1080x360 with 0 Axes>

Out[28]: [<matplotlib.lines.Line2D at 0x1ffff7ae460>]





```
In [29]: # Get all records for the month of Janaury(1959-01-01- 1959-01-31).
# Using boolean is not good method when we are dealing with Large datasets.
female[(pd.to_datetime(female['Date']) > pd.Timestamp(date(1959,1,1))) &
        (pd.to_datetime(female['Date']) < pd.Timestamp(date(1959,1,31)))]
```

Out[29]:

	Date	Births	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
1	1959-01-02	32	1	2	1959	1	4	Friday	January
2	1959-01-03	30	1	3	1959	1	5	Saturday	January
3	1959-01-04	31	1	4	1959	1	6	Sunday	January
4	1959-01-05	44	1	5	1959	2	0	Monday	January
5	1959-01-06	29	1	6	1959	2	1	Tuesday	January
6	1959-01-07	45	1	7	1959	2	2	Wednesday	January
7	1959-01-08	43	1	8	1959	2	3	Thursday	January
8	1959-01-09	38	1	9	1959	2	4	Friday	January
9	1959-01-10	27	1	10	1959	2	5	Saturday	January
10	1959-01-11	38	1	11	1959	2	6	Sunday	January
11	1959-01-12	33	1	12	1959	3	0	Monday	January
12	1959-01-13	55	1	13	1959	3	1	Tuesday	January
13	1959-01-14	47	1	14	1959	3	2	Wednesday	January
14	1959-01-15	45	1	15	1959	3	3	Thursday	January
15	1959-01-16	37	1	16	1959	3	4	Friday	January
16	1959-01-17	50	1	17	1959	3	5	Saturday	January
17	1959-01-18	43	1	18	1959	3	6	Sunday	January
18	1959-01-19	41	1	19	1959	4	0	Monday	January
19	1959-01-20	52	1	20	1959	4	1	Tuesday	January
20	1959-01-21	34	1	21	1959	4	2	Wednesday	January
21	1959-01-22	53	1	22	1959	4	3	Thursday	January
22	1959-01-23	39	1	23	1959	4	4	Friday	January
23	1959-01-24	32	1	24	1959	4	5	Saturday	January
24	1959-01-25	37	1	25	1959	4	6	Sunday	January
25	1959-01-26	43	1	26	1959	5	0	Monday	January
26	1959-01-27	39	1	27	1959	5	1	Tuesday	January
27	1959-01-28	35	1	28	1959	5	2	Wednesday	January
28	1959-01-29	44	1	29	1959	5	3	Thursday	January
29	1959-01-30	38	1	30	1959	5	4	Friday	January

```
In [30]: # Convert date column into Datetime index for faster selection.
female = female.set_index(['Date'])
female
female.index # DatetimeIndex
```

Out[30]:

	Births	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
Date								
1959-01-01	35	1	1	1959	1	3	Thursday	January
1959-01-02	32	1	2	1959	1	4	Friday	January
1959-01-03	30	1	3	1959	1	5	Saturday	January
1959-01-04	31	1	4	1959	1	6	Sunday	January
1959-01-05	44	1	5	1959	2	0	Monday	January
...	...	...	...	...	...	...	...	...
1959-12-27	37	12	27	1959	52	6	Sunday	December
1959-12-28	52	12	28	1959	53	0	Monday	December
1959-12-29	48	12	29	1959	53	1	Tuesday	December
1959-12-30	55	12	30	1959	53	2	Wednesday	December
1959-12-31	50	12	31	1959	53	3	Thursday	December

365 rows × 8 columns

```
Out[30]: DatetimeIndex(['1959-01-01', '1959-01-02', '1959-01-03', '1959-01-04',
                        '1959-01-05', '1959-01-06', '1959-01-07', '1959-01-08',
                        '1959-01-09', '1959-01-10',
                        ...,
                        '1959-12-22', '1959-12-23', '1959-12-24', '1959-12-25',
                        '1959-12-26', '1959-12-27', '1959-12-28', '1959-12-29',
                        '1959-12-30', '1959-12-31'],
                        dtype='datetime64[ns]', name='Date', length=365, freq=None)
```



In [31]:

# Now Lets select the data  
female.loc['1959'] # Get all data for year 1959

Out[31]:

	Births	Month	Day	Year	Week Number	Day Of Week	Day Name	Month Name
Date								
1959-01-01	35	1	1	1959	1	3	Thursday	January
1959-01-02	32	1	2	1959	1	4	Friday	January
1959-01-03	30	1	3	1959	1	5	Saturday	January
1959-01-04	31	1	4	1959	1	6	Sunday	January
1959-01-05	44	1	5	1959	2	0	Monday	January
...	...	...	...	...	...	...	...	...
1959-12-27	37	12	27	1959	52	6	Sunday	December
1959-12-28	52	12	28	1959	53	0	Monday	December
1959-12-29	48	12	29	1959	53	1	Tuesday	December
1959-12-30	55	12	30	1959	53	2	Wednesday	December
1959-12-31	50	12	31	1959	53	3	Thursday	December

365 rows × 8 columns

```
In [32]: female.loc['1960'] # There is no data for 1960.
```

-----  
**KeyError** Traceback (most recent call last)  
pandas\\_libs\index.pyx in pandas\\_libs.index.DatetimeEngine.get\_loc()  
  
pandas\\_libs\hashtable\_class\_helper.pxi in pandas\\_libs.hashtable.Int64HashTable.get\_item()  
  
pandas\\_libs\hashtable\_class\_helper.pxi in pandas\\_libs.hashtable.Int64HashTable.get\_item()  
  
**KeyError**: -315619200000000000

During handling of the above exception, another exception occurred:

**KeyError** Traceback (most recent call last)  
C:\Anaconda\lib\site-packages\pandas\core\indexes\base.py in get\_loc(self, key, method, tolerance)  
 2894 try:  
-> 2895 return self.\_engine.get\_loc(casted\_key)  
 2896 except KeyError as err:  
  
pandas\\_libs\index.pyx in pandas\\_libs.index.DatetimeEngine.get\_loc()  
  
pandas\\_libs\index.pyx in pandas\\_libs.index.DatetimeEngine.get\_loc()  
  
**KeyError**: Timestamp('1960-01-01 00:00:00')

The above exception was the direct cause of the following exception:

**KeyError** Traceback (most recent call last)  
C:\Anaconda\lib\site-packages\pandas\core\indexes\datetime.py in get\_loc(self, key, method, tolerance)  
 624 try:  
--> 625 return Index.get\_loc(self, key, method, tolerance)  
 626 except KeyError as err:  
  
C:\Anaconda\lib\site-packages\pandas\core\indexes\base.py in get\_loc(self, key, method, tolerance)  
 2896 except KeyError as err:  
-> 2897 raise KeyError(key) from err  
 2898  
  
**KeyError**: Timestamp('1960-01-01 00:00:00')

The above exception was the direct cause of the following exception:

**KeyError** Traceback (most recent call last)  
<ipython-input-32-9af28ea95a40> in <module>  
----> 1 female.loc['1960'] # There is no data for 1960.  
  
C:\Anaconda\lib\site-packages\pandas\core\indexing.py in \_\_getitem\_\_(self, key)  
 877  
 878 maybe\_callable = com.apply\_if\_callable(key, self.obj)  
--> 879 return self.\_getitem\_axis(maybe\_callable, axis=axis)  
 880  
 881 def \_is\_scalar\_access(self, key: Tuple):  
  
C:\Anaconda\lib\site-packages\pandas\core\indexing.py in \_getitem\_axis(self, key, axis)  
 1108 # fall thru to straight lookup  
 1109 self.\_validate\_key(key, axis)  
-> 1110 return self.\_get\_label(key, axis=axis)  
 1111  
 1112 def \_get\_slice\_axis(self, slice\_obj: slice, axis: int):  
  
C:\Anaconda\lib\site-packages\pandas\core\indexing.py in \_get\_label(self, label, axis)  
 1057 def \_get\_label(self, label, axis: int):  
 1058 # GH#5667 this will fail if the label is not present in the axis.  
-> 1059 return self.obj.xs(label, axis=axis)  
 1060  
 1061 def \_handle\_lowerdim\_multi\_index\_axis0(self, tup: Tuple):  
  
C:\Anaconda\lib\site-packages\pandas\core\generic.py in xs(self, key, axis, level, drop\_level)  
 3489 loc, new\_index = self.index.get\_loc\_level(key, drop\_level=drop\_level)  
 3490 else:  
-> 3491 loc = self.index.get\_loc(key)  
 3492  
 3493 if isinstance(loc, np.ndarray):  
  
C:\Anaconda\lib\site-packages\pandas\core\indexes\datetime.py in get\_loc(self, key, method, tolerance)  
 625 return Index.get\_loc(self, key, method, tolerance)  
 626 except KeyError as err:  
--> 627 raise KeyError(orig\_key) from err  
 628  
 629 def \_maybe\_cast\_for\_get\_loc(self, key) -> Timestamp:  
  
**KeyError**: '1960'

In [33]:

# Get all rows for the month of Janaury(1959-01-01 - 1959-01-31).  
female.loc['1959-01-01':'1959-01-31'][['Births']]

Out[33]:

Births	
Date	
1959-01-01	35
1959-01-02	32
1959-01-03	30
1959-01-04	31
1959-01-05	44
1959-01-06	29
1959-01-07	45
1959-01-08	43
1959-01-09	38
1959-01-10	27
1959-01-11	38
1959-01-12	33
1959-01-13	55
1959-01-14	47
1959-01-15	45
1959-01-16	37
1959-01-17	50
1959-01-18	43
1959-01-19	41
1959-01-20	52
1959-01-21	34
1959-01-22	53
1959-01-23	39
1959-01-24	32
1959-01-25	37
1959-01-26	43
1959-01-27	39
1959-01-28	35
1959-01-29	44
1959-01-30	38
1959-01-31	24

In [34]:

# Total births in the month of January  
female.loc['1959-01-01':'1959-01-31'][['Births']].sum()

Out[34]:

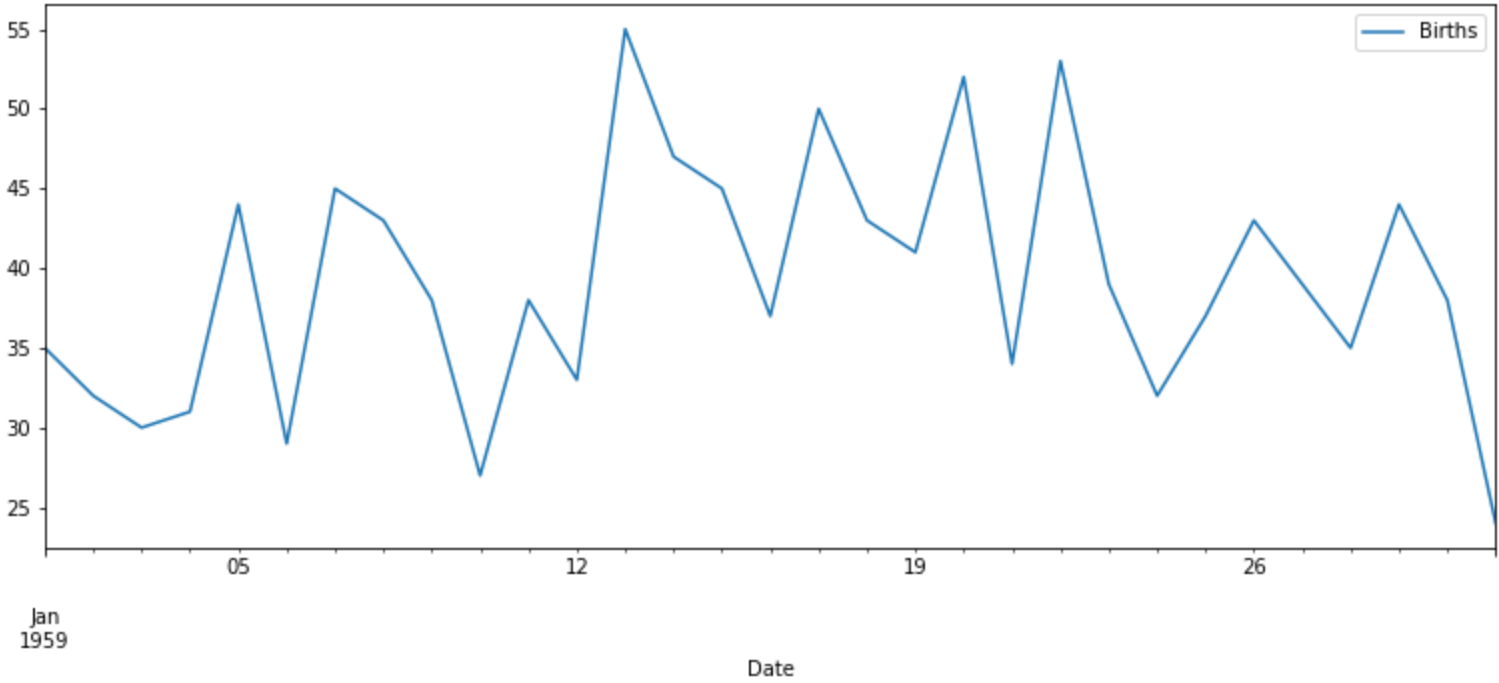
Births 1213  
dtype: int64

In [35]:

# plot line chart for January data using Pandas visualization  
female.loc['1959-01-01':'1959-01-31'][['Births']].plot(figsize=(13,5))

Out[35]:

<AxesSubplot:xlabel='Date'>

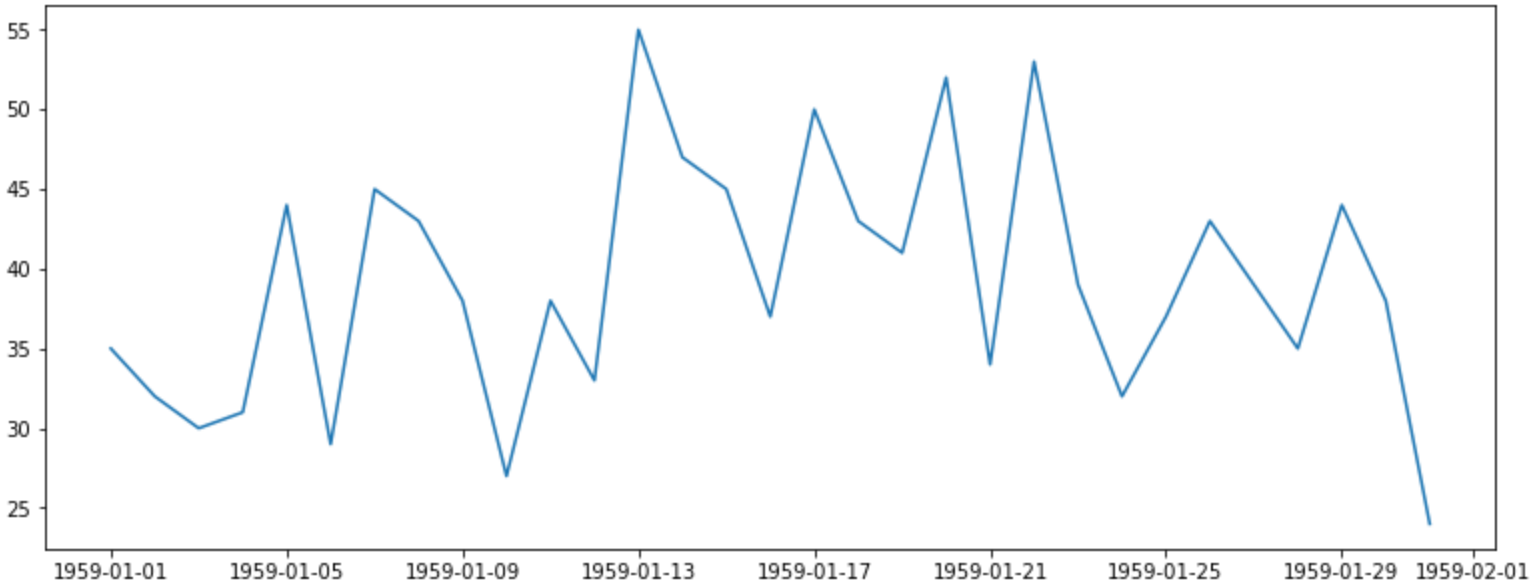


In [36]:

```
# plot line chart for January data using Matplotlib library
plt.figure(figsize=(13,5))
plt.plot(female.loc['1959-01-01':'1959-01-31']['Births'])
```

Out[36]: <Figure size 936x360 with 0 Axes>

Out[36]: <matplotlib.lines.Line2D at 0x1fffff43c70>



In [37]:

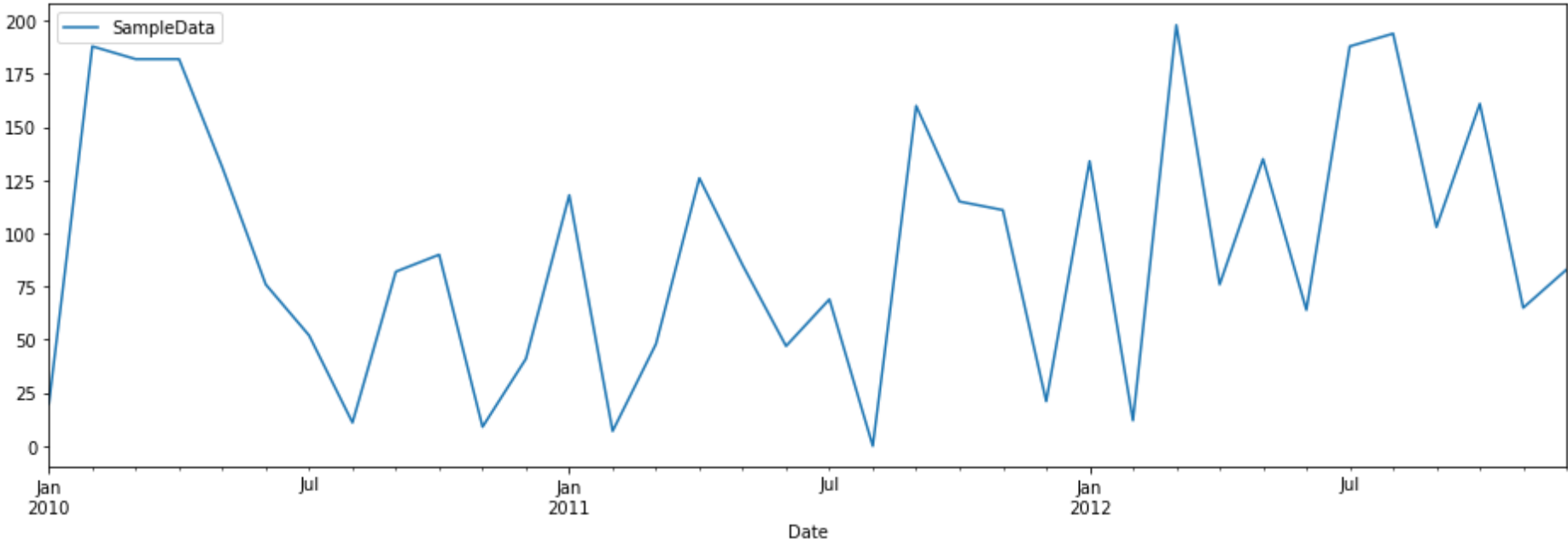
```
#Generate Test Dataset using date_range() and random.randint()
df = pd.DataFrame({'Date':pd.date_range('1/19/1920', periods = 1200, freq = 'M') , 'SampleData':np.random.randint(0,200,size=1200)})
df=df.set_index(['Date']) # Set Date column as index
df
df.loc['2010':'2012'].plot(figsize=(16,5)) # Plot line chart for data between 2010-2012
```

Out[37]:

SampleData	
Date	
1920-01-31	11
1920-02-29	62
1920-03-31	192
1920-04-30	152
1920-05-31	146
...	...
2019-08-31	198
2019-09-30	83
2019-10-31	29
2019-11-30	194
2019-12-31	51

1200 rows × 1 columns

Out[37]: <AxesSubplot:xlabel='Date'>



▼ End

In [ ]:

