

How to plot a Pandas Dataframe with Matplotlib?

Data visualization is the most important part of any analysis. Matplotlib is an amazing python library which can be used to plot pandas dataframe. There are various ways in which a plot can be generated depending upon the requirement.

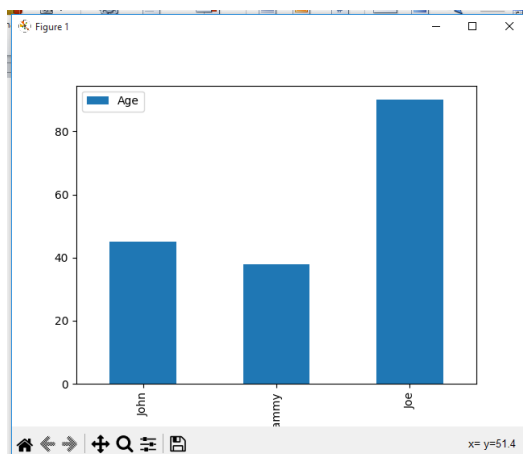
Bar Plot is one such example. To plot a bar graph using plot() function will be used.

```
# importing pandas library
import pandas as pd
# importing matplotlib library
import matplotlib.pyplot as plt

# creating dataframe
df = pd.DataFrame({
    'Name': ['John', 'Sammy', 'Joe'],
    'Age': [45, 38, 90]
})

# plotting a bar graph
df.plot(x="Name", y="Age", kind="bar")
plt.show()
```

output:-



Visualizing continuous data

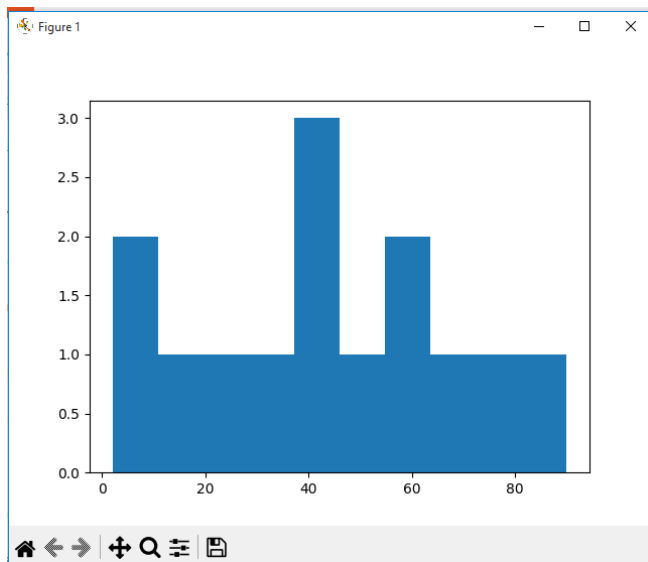
Histogram is an example of representing data as which is divided into closely related intervals. For this hist() function will be employed.

```
# importing pandas library
import pandas as pd
# importing matplotlib library
import matplotlib.pyplot as plt

# creating dataframe
df = pd.DataFrame({
    'Age': [45, 38, 90, 60, 40, 50, 2, 32, 8, 15, 27, 69, 73, 55]
})

# plotting a histogram
plt.hist(df["Age"])
plt.show()
```

Output:-



For data distribution

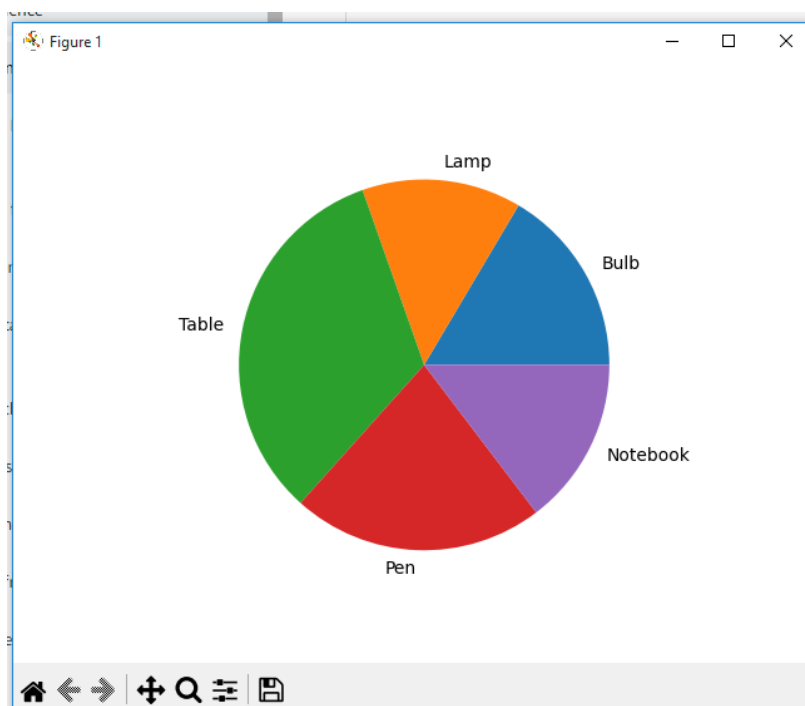
Pie Chart is a great way of representing data which is a part of a whole. To plot a pie chart pie() function will be used.

```
# importing pandas library
import pandas as pd
# importing matplotlib library
import matplotlib.pyplot as plt

# creating dataframe
df = pd.DataFrame({
    'Object': ['Bulb', 'Lamp', 'Table', 'Pen', 'Notebook'],
    'Price': [45, 38, 90, 60, 40]
})

# plotting a pie chart
plt.pie(df["Price"], labels=df["Object"])
plt.show()
```

Output:-



Dependency of data

In situations, where data is to be interpreted depending on dependent and non-dependent parameters, graphs like Line chart or Scatter plot, are used. To plot a line graph plot() function is sufficient but to visualize a scatter plot scatter() is used.

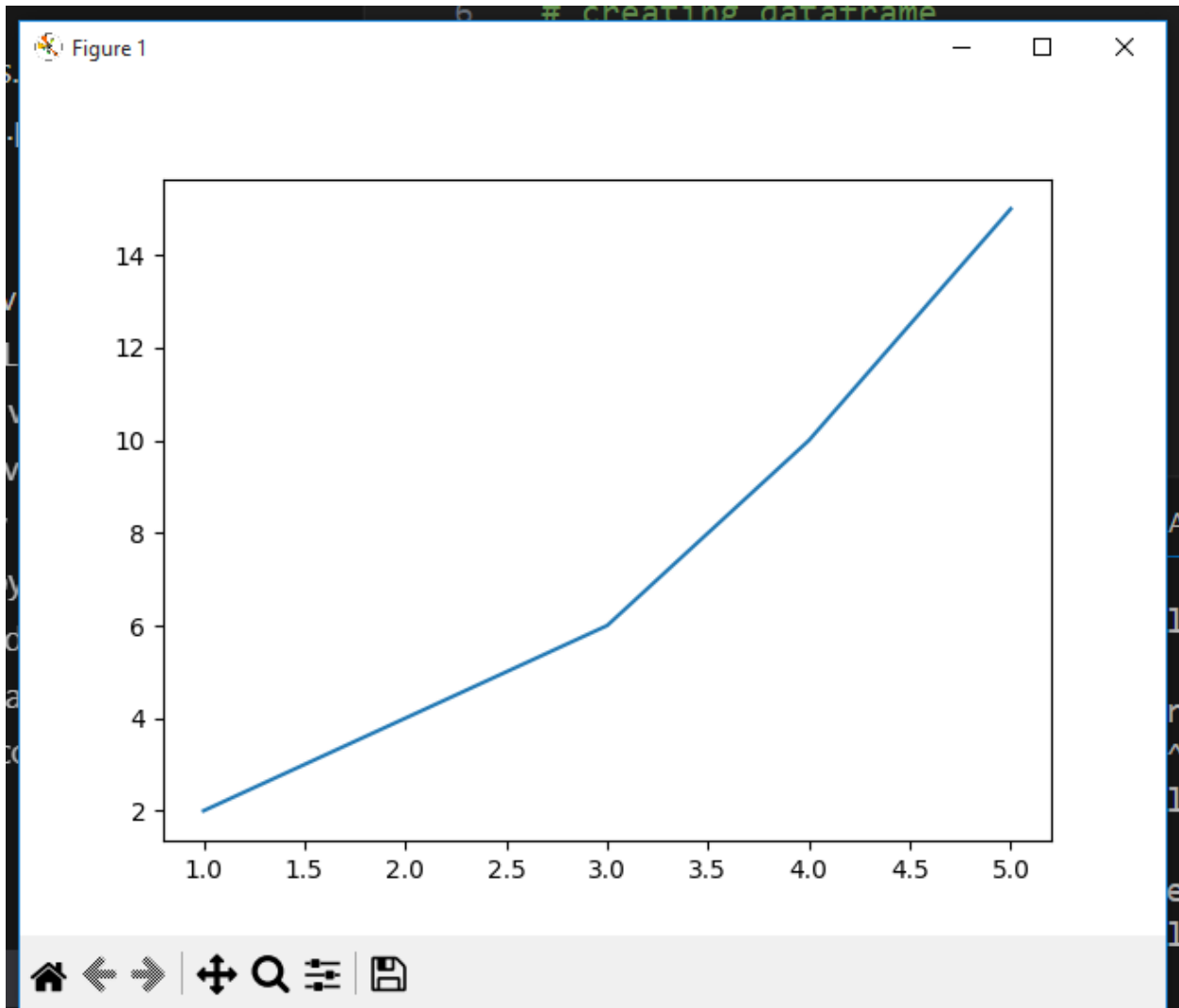
```
# importing pandas library
import pandas as pd
# importing matplotlib library
import matplotlib.pyplot as plt

# creating dataframe
df = pd.DataFrame({
    'X': [1, 2, 3, 4, 5],
    'Y': [2, 4, 6, 10, 15]
})

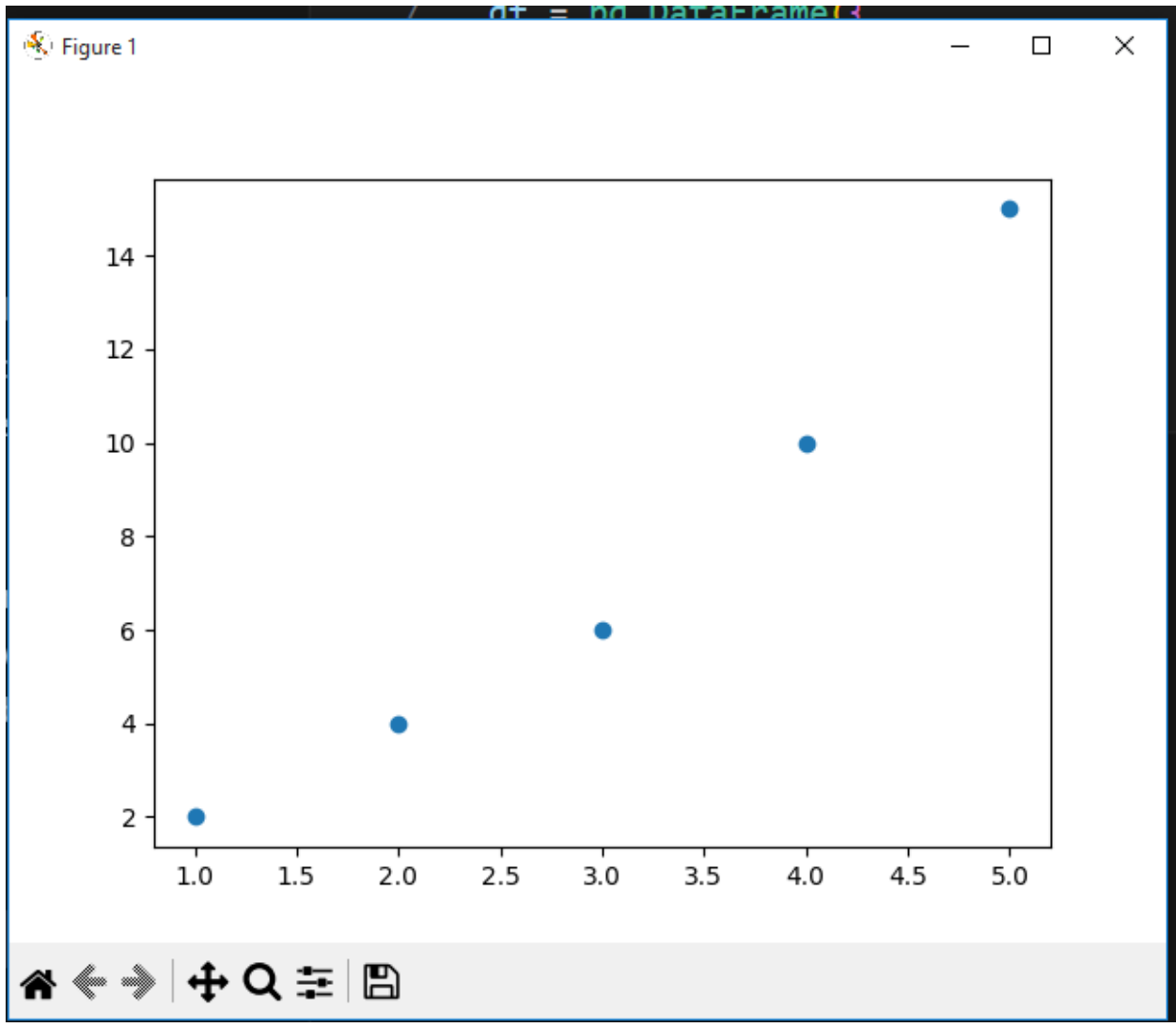
# plotting a line graph
print("Line graph: ")
plt.plot(df["X"], df["Y"])
plt.show()

# plotting a scatter plot
print("Scatter Plot: ")
plt.scatter(df["X"], df["Y"])
plt.show()
```

Output:-



Scatter :-



Reading csv file and plotting Scatter example :-

Create csv file `scottish_hills.csv`

	A	B	C	D	E
1	Hill Name	Height	Latitude	Longitude	Osgrid
2	A' Bhuidheanach Bhea	936	56.870342	-4.199001	NN660775
3	A' Chailleach	997	57.6938	-5.128715	NH136714
4	A' Chailleach	929.2	57.109564	-4.179285	NH681041
5	A' Chraileag (A' Chralai	1120	57.184186	-5.154837	NH094147
6	A' Ghlas-bheinn	918	57.25509	-5.303687	NH008231
7	A' Mhaighdean	967	57.719644	-5.34672	NH007749
8	A' Mharconaich	973.2	56.857002	-4.290668	NN604762
9	Am Basteir	934	57.247931	-6.202982	NG465253
10	Am Bodach	1031.8	56.741727	-4.983393	NN176650
11	Am Faochagach	953	57.771801	-4.853899	NH303793
12	An Caisteal	995.8	56.3386	-4.624368	NN378193
13	An Coileachan	923.9	57.667625	-4.949498	NH241680
14	An Gearanach	981.4	56.759143	-4.966203	NN187669
15	An Riabhachan	1129	57.362429	-5.104728	NH133344
16	An Sgarsoch	1006.5	56.932109	-3.754294	NN933836
17	An Socach	1069	57.350229	-5.158603	NH100332
18	An Socach	944	56.902286	-3.513148	NO079800

Example code:-

```
import pandas as pd
import matplotlib.pyplot as plt

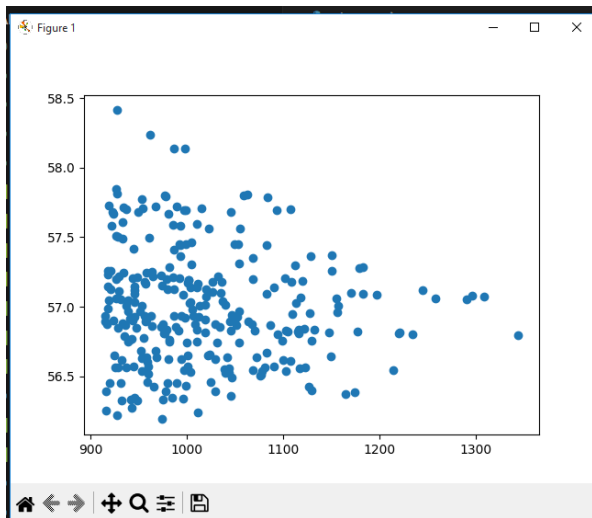
dataframe = pd.read_csv("scottish_hills.csv")

x = dataframe.Height
y = dataframe.Latitude

plt.scatter(x, y)

plt.show()
```

Output:-



Example 2:-

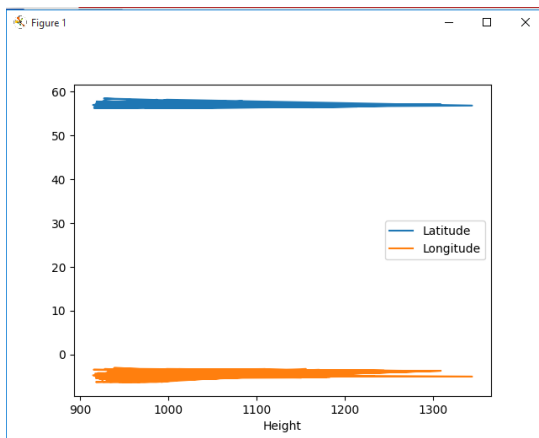
```
import pandas as pd
import matplotlib.pyplot as plt

dataframe = pd.read_csv("scottish_hills.csv")

dataframe.plot(x="Height", y=["Latitude", "Longitude"])

plt.show()
```

Output:-



Example 3:-

csv file data `scottish_hills.csv`:-

	A	B	C	D	
1	Hill Name	Height	Latitude	Longitude	Osgrid
2	A' Bhuidheanach Bhea	936	56.870342	-4.199001	NN660775
3	A' Chailleach	997	57.6938	-5.128715	NH136714
4	A' Chailleach	929.2	57.109564	-4.179285	NH681041
5	A' Chraileag (A' Chralai	1120	57.184186	-5.154837	NH094147
6	A' Ghlas-bheinn	918	57.25509	-5.303687	NH008231
7	A' Mhaighdean	967	57.719644	-5.34672	NH007749
8	A' Mharconaich	973.2	56.857002	-4.290668	NN604762
9	Am Basteir	934	57.247931	-6.202982	NG465253
10	Am Bodach	1031.8	56.741727	-4.983393	NN176650
11	Am Faochagach	953	57.771801	-4.853899	NH303793
12	An Caisteal	995.8	56.3386	-4.624368	NN378193
13	An Coileachan	923.9	57.667625	-4.949498	NH241680
14					
15					

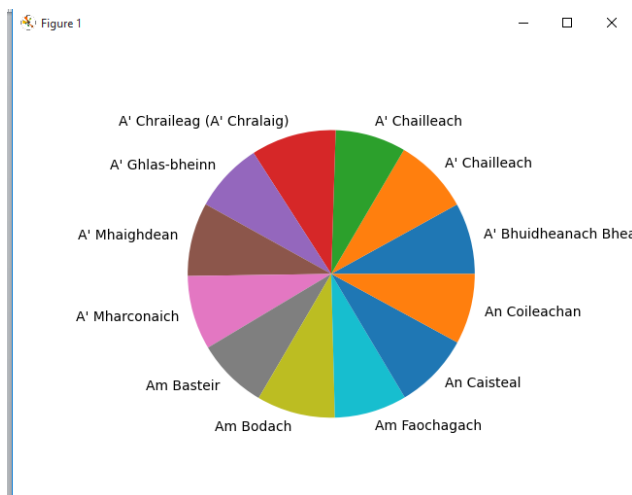
```
import pandas as pd
import matplotlib.pyplot as plt

dataframe = pd.read_csv("scottish_hills.csv")

plt.pie(dataframe["Height"], labels=dataframe["Hill Name"])

plt.show()
```

Output:-



Example 4:-

csv file `scottish_hills.csv`:-

	A	B	C	D	
1	Hill Name	Height	Latitude	Longitude	Osgrid
2	A' Bhuidheanach Bhea	936	56.870342	-4.199001	NN660775
3	A' Chailleach	997	57.6938	-5.128715	NH136714
4	A' Chailleach	929.2	57.109564	-4.179285	NH681041
5	A' Chraileag (A' Chralai	1120	57.184186	-5.154837	NH094147
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7	A' Mhaighdean	967	57.719644	-5.34672	NH007749
8	A' Mharconaich	973.2	56.857002	-4.290668	NN604762
9	Am Basteir	934	57.247931	-6.202982	NG465253
10	Am Bodach	1031.8	56.741727	-4.983393	NN176650
11	Am Faochagach	953	57.771801	-4.853899	NH303793
12	An Caisteal	995.8	56.3386	-4.624368	NN378193
13	An Coileachan	923.9	57.667625	-4.949498	NH241680

```
import pandas as pd
import matplotlib.pyplot as plt

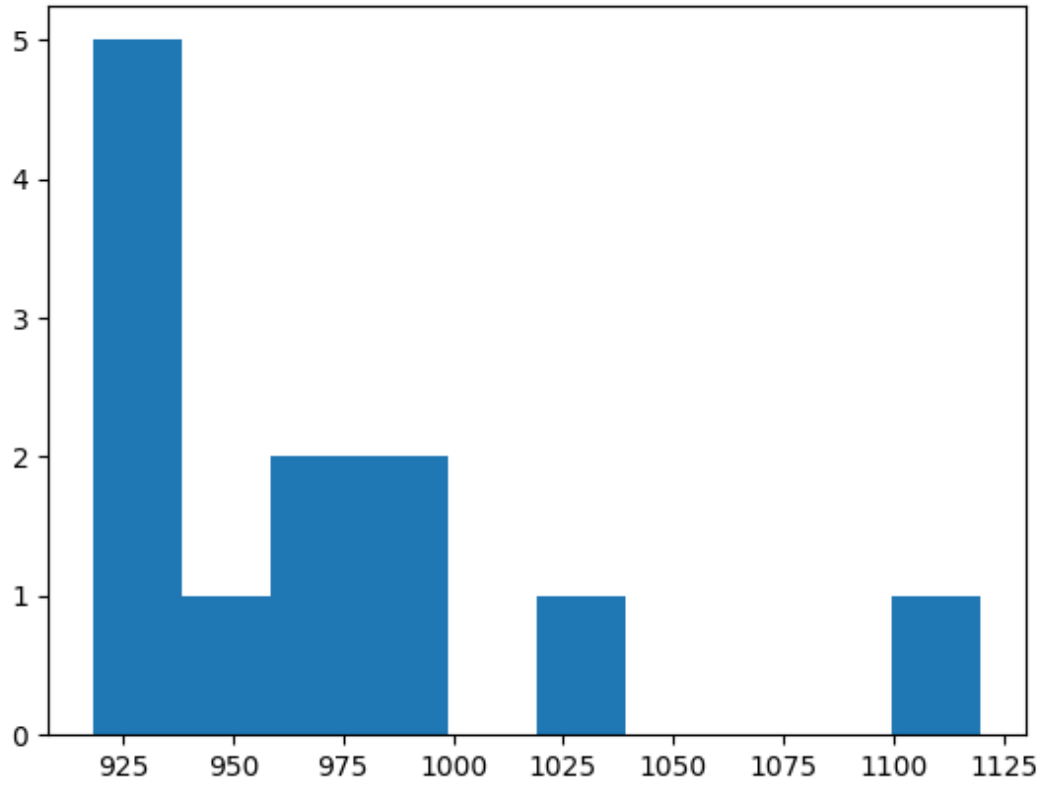
dataframe = pd.read_csv("scottish_hills.csv")

plt.hist(dataframe["Height"])

plt.show()
```

Output:-

Figure 1



Bar Graph example :-

csv file `scottish_hills.csv`:-

	A	B	C	D	
1	Hill Name	Height	Latitude	Longitude	Osgrid
2	A' Bhuidheanach Bhea	936	56.870342	-4.199001	NN660775
3	A' Chailleach	997	57.6938	-5.128715	NH136714
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9	Am Basteir	934	57.247931	-6.202982	NG465253
10	Am Bodach	1031.8	56.741727	-4.983393	NN176650
11	Am Faochagach	953	57.771801	-4.853899	NH303793
12	An Caisteal	995.8	56.3386	-4.624368	NN378193
13	An Coileachan	923.9	57.667625	-4.949498	NH241680

```
import pandas as pd
import matplotlib.pyplot as plt

dataframe = pd.read_csv("scottish_hills.csv")

dataframe.plot(x="Height", y="Latitude", kind="bar")
plt.show()
```

output:-

Figure 1

