

```

from sklearn import datasets
import numpy as np
import pandas as pd
import numpy as np
diabetes=datasets.load_diabetes()
print(diabetes)

{'data': array([[ 0.03807591,  0.05068012,  0.06169621, ..., -
0.00259226,
                0.01990842, -0.01764613],
               [-0.00188202, -0.04464164, -0.05147406, ..., -0.03949338,
               -0.06832974, -0.09220405],
               [ 0.08529891,  0.05068012,  0.04445121, ..., -0.00259226,
               0.00286377, -0.02593034],
               ...,
               [ 0.04170844,  0.05068012, -0.01590626, ..., -0.01107952,
               -0.04687948,  0.01549073],
               [-0.04547248, -0.04464164,  0.03906215, ...,  0.02655962,
               0.04452837, -0.02593034],
               [-0.04547248, -0.04464164, -0.0730303 , ..., -0.03949338,
               -0.00421986,  0.00306441]]), 'target': array([151., 75.,
141., 206., 135., 97., 138., 63., 110., 310., 101.,
69., 179., 185., 118., 171., 166., 144., 97., 168., 68.,
49.,
68., 245., 184., 202., 137., 85., 131., 283., 129., 59.,
341.,
87., 65., 102., 265., 276., 252., 90., 100., 55., 61.,
92.,
259., 53., 190., 142., 75., 142., 155., 225., 59., 104.,
182.,
128., 52., 37., 170., 170., 61., 144., 52., 128., 71.,
163.,
150., 97., 160., 178., 48., 270., 202., 111., 85., 42.,
170.,
200., 252., 113., 143., 51., 52., 210., 65., 141., 55.,
134.,
42., 111., 98., 164., 48., 96., 90., 162., 150., 279.,
92.,
83., 128., 102., 302., 198., 95., 53., 134., 144., 232.,
81.,
104., 59., 246., 297., 258., 229., 275., 281., 179., 200.,
200.,
173., 180., 84., 121., 161., 99., 109., 115., 268., 274.,
158.,
107., 83., 103., 272., 85., 280., 336., 281., 118., 317.,
235.,
60., 174., 259., 178., 128., 96., 126., 288., 88., 292.,
71.,
197., 186., 25., 84., 96., 195., 53., 217., 172., 131.,
214.,

```

127.,	59.,	70.,	220.,	268.,	152.,	47.,	74.,	295.,	101.,	151.,
137.,	237.,	225.,	81.,	151.,	107.,	64.,	138.,	185.,	265.,	101.,
129.,	143.,	141.,	79.,	292.,	178.,	91.,	116.,	86.,	122.,	72.,
155.,	142.,	90.,	158.,	39.,	196.,	222.,	277.,	99.,	196.,	202.,
185.,	77.,	191.,	70.,	73.,	49.,	65.,	263.,	248.,	296.,	214.,
220.,	78.,	93.,	252.,	150.,	77.,	208.,	77.,	108.,	160.,	53.,
177.,	154.,	259.,	90.,	246.,	124.,	67.,	72.,	257.,	262.,	275.,
91.,	71.,	47.,	187.,	125.,	78.,	51.,	258.,	215.,	303.,	243.,
116.,	150.,	310.,	153.,	346.,	63.,	89.,	50.,	39.,	103.,	308.,
66.,	145.,	74.,	45.,	115.,	264.,	87.,	202.,	127.,	182.,	241.,
233.,	94.,	283.,	64.,	102.,	200.,	265.,	94.,	230.,	181.,	156.,
89.,	60.,	219.,	80.,	68.,	332.,	248.,	84.,	200.,	55.,	85.,
172.,	31.,	129.,	83.,	275.,	65.,	198.,	236.,	253.,	124.,	44.,
109.,	114.,	142.,	109.,	180.,	144.,	163.,	147.,	97.,	220.,	190.,
135.,	191.,	122.,	230.,	242.,	248.,	249.,	192.,	131.,	237.,	78.,
216.,	244.,	199.,	270.,	164.,	72.,	96.,	306.,	91.,	214.,	95.,
71.,	263.,	178.,	113.,	200.,	139.,	139.,	88.,	148.,	88.,	243.,
321.,	77.,	109.,	272.,	60.,	54.,	221.,	90.,	311.,	281.,	182.,
168.,	58.,	262.,	206.,	233.,	242.,	123.,	167.,	63.,	197.,	71.,
69.,	140.,	217.,	121.,	235.,	245.,	40.,	52.,	104.,	132.,	88.,
258.,	219.,	72.,	201.,	110.,	51.,	277.,	63.,	118.,	69.,	273.,
72.,	43.,	198.,	242.,	232.,	175.,	93.,	168.,	275.,	293.,	281.,
55.,	140.,	189.,	181.,	209.,	136.,	261.,	113.,	131.,	174.,	257.,
310.,	84.,	42.,	146.,	212.,	233.,	91.,	111.,	152.,	120.,	67.,
	94.,	183.,	66.,	173.,	72.,	49.,	64.,	48.,	178.,	104.,

```

132., 220., 57.]), 'frame': None, 'DESCR': '.._diabetes_dataset:\n
nDiabetes dataset\n-----\n\nTen baseline variables, age,
sex, body mass index, average blood\npressure, and six blood serum
measurements were obtained for each of n=\n442 diabetes patients, as
well as the response of interest, a\nquantitative measure of disease
progression one year after baseline.\n\n**Data Set Characteristics:**\n
\n :Number of Instances: 442\n\n :Number of Attributes: First 10
columns are numeric predictive values\n\n :Target: Column 11 is a
quantitative measure of disease progression one year after baseline\n
\n :Attribute Information:\n      - age      age in years\n      - sex\n
n      - bmi      body mass index\n      - bp      average blood
pressure\n      - s1      tc, total serum cholesterol\n      - s2
ldl, low-density lipoproteins\n      - s3      hdl, high-density
lipoproteins\n      - s4      tch, total cholesterol / HDL\n      - s5
ltg, possibly log of serum triglycerides level\n      - s6      glu,
blood sugar level\n\nNote: Each of these 10 feature variables have
been mean centered and scaled by the standard deviation times
`n_samples` (i.e. the sum of squares of each column totals 1).\n
\nSource
URL:\nhttps://www4.stat.ncsu.edu/~boos/var.select/diabetes.html\n\nFor
more information see:\nBradley Efron, Trevor Hastie, Iain Johnstone
and Robert Tibshirani (2004) "Least Angle Regression," Annals of
Statistics (with discussion),
407-499.\n(https://web.stanford.edu/~hastie/Papers/LARS/LeastAngle_200
2.pdf)', 'feature_names': ['age', 'sex', 'bmi', 'bp', 's1', 's2',
's3', 's4', 's5', 's6'], 'data_filename': 'diabetes_data.csv.gz',
'target_filename': 'diabetes_target.csv.gz', 'data_module':
'sklearn.datasets.data'}

```

```
print(type(diabetes))
```

```
<class 'sklearn.utils.Bunch'>
```

```
print(type(diabetes.data))
```

```
<class 'numpy.ndarray'>
```

```
print(type(diabetes.target))
```

```
<class 'numpy.ndarray'>
```

```
print(diabetes.keys())
```

```
dict_keys(['data', 'target', 'frame', 'DESCR', 'feature_names',
'data_filename', 'target_filename', 'data_module'])
```

```
print(diabetes.data.shape)
```

```
(442, 10)
```

```
print(diabetes.target_names)
```

```

-----
-----
KeyError                                Traceback (most recent call
last)
File ~\anaconda3\lib\site-packages\sklearn\utils\__init__.py:117, in
Bunch.__getattr__(self, key)
    116 try:
--> 117     return self[key]
    118 except KeyError:

```

KeyError: 'target_names'

During handling of the above exception, another exception occurred:

```

AttributeError                          Traceback (most recent call
last)
Input In [13], in <cell line: 1>()
----> 1 print(diabetes.target_names)

File ~\anaconda3\lib\site-packages\sklearn\utils\__init__.py:119, in
Bunch.__getattr__(self, key)
    117     return self[key]
    118 except KeyError:
--> 119     raise AttributeError(key)

```

AttributeError: target_names

```

x=diabetes.data
y=diabetes.target
print(x)
print(y)

```

```

[[ 0.03807591  0.05068012  0.06169621 ... -0.00259226  0.01990842
  -0.01764613]
 [-0.00188202 -0.04464164 -0.05147406 ... -0.03949338 -0.06832974
  -0.09220405]
 [ 0.08529891  0.05068012  0.04445121 ... -0.00259226  0.00286377
  -0.02593034]
 ...
 [ 0.04170844  0.05068012 -0.01590626 ... -0.01107952 -0.04687948
   0.01549073]
 [-0.04547248 -0.04464164  0.03906215 ...  0.02655962  0.04452837
  -0.02593034]
 [-0.04547248 -0.04464164 -0.0730303 ... -0.03949338 -0.00421986
   0.00306441]]
[151.  75. 141. 206. 135.  97. 138.  63. 110. 310. 101.  69. 179. 185.
 118. 171. 166. 144.  97. 168.  68.  49.  68. 245. 184. 202. 137.  85.
 131. 283. 129.  59. 341.  87.  65. 102. 265. 276. 252.  90. 100.  55.
  61.  92. 259.  53. 190. 142.  75. 142. 155. 225.  59. 104. 182. 128.
  52.  37. 170. 170.  61. 144.  52. 128.  71. 163. 150.  97. 160. 178.]

```

```

48. 270. 202. 111. 85. 42. 170. 200. 252. 113. 143. 51. 52. 210.
65. 141. 55. 134. 42. 111. 98. 164. 48. 96. 90. 162. 150. 279.
92. 83. 128. 102. 302. 198. 95. 53. 134. 144. 232. 81. 104. 59.
246. 297. 258. 229. 275. 281. 179. 200. 200. 173. 180. 84. 121. 161.
99. 109. 115. 268. 274. 158. 107. 83. 103. 272. 85. 280. 336. 281.
118. 317. 235. 60. 174. 259. 178. 128. 96. 126. 288. 88. 292. 71.
197. 186. 25. 84. 96. 195. 53. 217. 172. 131. 214. 59. 70. 220.
268. 152. 47. 74. 295. 101. 151. 127. 237. 225. 81. 151. 107. 64.
138. 185. 265. 101. 137. 143. 141. 79. 292. 178. 91. 116. 86. 122.
72. 129. 142. 90. 158. 39. 196. 222. 277. 99. 196. 202. 155. 77.
191. 70. 73. 49. 65. 263. 248. 296. 214. 185. 78. 93. 252. 150.
77. 208. 77. 108. 160. 53. 220. 154. 259. 90. 246. 124. 67. 72.
257. 262. 275. 177. 71. 47. 187. 125. 78. 51. 258. 215. 303. 243.
91. 150. 310. 153. 346. 63. 89. 50. 39. 103. 308. 116. 145. 74.
45. 115. 264. 87. 202. 127. 182. 241. 66. 94. 283. 64. 102. 200.
265. 94. 230. 181. 156. 233. 60. 219. 80. 68. 332. 248. 84. 200.
55. 85. 89. 31. 129. 83. 275. 65. 198. 236. 253. 124. 44. 172.
114. 142. 109. 180. 144. 163. 147. 97. 220. 190. 109. 191. 122. 230.
242. 248. 249. 192. 131. 237. 78. 135. 244. 199. 270. 164. 72. 96.
306. 91. 214. 95. 216. 263. 178. 113. 200. 139. 139. 88. 148. 88.
243. 71. 77. 109. 272. 60. 54. 221. 90. 311. 281. 182. 321. 58.
262. 206. 233. 242. 123. 167. 63. 197. 71. 168. 140. 217. 121. 235.
245. 40. 52. 104. 132. 88. 69. 219. 72. 201. 110. 51. 277. 63.
118. 69. 273. 258. 43. 198. 242. 232. 175. 93. 168. 275. 293. 281.
72. 140. 189. 181. 209. 136. 261. 113. 131. 174. 257. 55. 84. 42.
146. 212. 233. 91. 111. 152. 120. 67. 310. 94. 183. 66. 173. 72.
49. 64. 48. 178. 104. 132. 220. 57.]

```

```
#convert dataset to dataframe
```

```
df=pd.DataFrame(x,columns=diabetes.feature_names)
```

```
print(df)
```

```

          age      sex      bmi      bp      s1      s2
s3 \
0    0.038076  0.050680  0.061696  0.021872 -0.044223 -0.034821 -
0.043401
1    -0.001882 -0.044642 -0.051474 -0.026328 -0.008449 -0.019163
0.074412
2    0.085299  0.050680  0.044451 -0.005671 -0.045599 -0.034194 -
0.032356
3    -0.089063 -0.044642 -0.011595 -0.036656  0.012191  0.024991 -
0.036038
4    0.005383 -0.044642 -0.036385  0.021872  0.003935  0.015596
0.008142
...      ...      ...      ...      ...      ...      ...
...
437  0.041708  0.050680  0.019662  0.059744 -0.005697 -0.002566 -
0.028674
438 -0.005515  0.050680 -0.015906 -0.067642  0.049341  0.079165 -
0.028674

```

```

439  0.041708  0.050680 -0.015906  0.017282 -0.037344 -0.013840 -
0.024993
440 -0.045472 -0.044642  0.039062  0.001215  0.016318  0.015283 -
0.028674
441 -0.045472 -0.044642 -0.073030 -0.081414  0.083740  0.027809
0.173816

```

```

      s4      s5      s6
0  -0.002592  0.019908 -0.017646
1  -0.039493 -0.068330 -0.092204
2  -0.002592  0.002864 -0.025930
3   0.034309  0.022692 -0.009362
4  -0.002592 -0.031991 -0.046641
..      ...      ...
437 -0.002592  0.031193  0.007207
438  0.034309 -0.018118  0.044485
439 -0.011080 -0.046879  0.015491
440  0.026560  0.044528 -0.025930
441 -0.039493 -0.004220  0.003064

```

[442 rows x 10 columns]

```
print(df.head()) #printing first 5 rows
```

```

      age      sex      bmi      bp      s1      s2
s3 \
0  0.038076  0.050680  0.061696  0.021872 -0.044223 -0.034821 -
0.043401
1 -0.001882 -0.044642 -0.051474 -0.026328 -0.008449 -0.019163
0.074412
2  0.085299  0.050680  0.044451 -0.005671 -0.045599 -0.034194 -
0.032356
3 -0.089063 -0.044642 -0.011595 -0.036656  0.012191  0.024991 -
0.036038
4  0.005383 -0.044642 -0.036385  0.021872  0.003935  0.015596
0.008142

```

```

      s4      s5      s6
0 -0.002592  0.019908 -0.017646
1 -0.039493 -0.068330 -0.092204
2 -0.002592  0.002864 -0.025930
3  0.034309  0.022692 -0.009362
4 -0.002592 -0.031991 -0.046641

```

```
print(df.tail())#printing last 5 rows
```

```

      age      sex      bmi      bp      s1      s2
s3 \
437  0.041708  0.050680  0.019662  0.059744 -0.005697 -0.002566 -
0.028674

```

```

438 -0.005515  0.050680 -0.015906 -0.067642  0.049341  0.079165 -
0.028674
439  0.041708  0.050680 -0.015906  0.017282 -0.037344 -0.013840 -
0.024993
440 -0.045472 -0.044642  0.039062  0.001215  0.016318  0.015283 -
0.028674
441 -0.045472 -0.044642 -0.073030 -0.081414  0.083740  0.027809
0.173816

```

```

          s4          s5          s6
437 -0.002592  0.031193  0.007207
438  0.034309 -0.018118  0.044485
439 -0.011080 -0.046879  0.015491
440  0.026560  0.044528 -0.025930
441 -0.039493 -0.004220  0.003064

```

```
print(df.describe())
```

```

          age          sex          bmi          bp
s1 \
count  4.420000e+02  4.420000e+02  4.420000e+02  4.420000e+02
4.420000e+02
mean   -3.634285e-16  1.308343e-16 -8.045349e-16  1.281655e-16 -
8.835316e-17
std     4.761905e-02  4.761905e-02  4.761905e-02  4.761905e-02
4.761905e-02
min     -1.072256e-01 -4.464164e-02 -9.027530e-02 -1.123996e-01 -
1.267807e-01
25%     -3.729927e-02 -4.464164e-02 -3.422907e-02 -3.665645e-02 -
3.424784e-02
50%      5.383060e-03 -4.464164e-02 -7.283766e-03 -5.670611e-03 -
4.320866e-03
75%      3.807591e-02  5.068012e-02  3.124802e-02  3.564384e-02
2.835801e-02
max      1.107267e-01  5.068012e-02  1.705552e-01  1.320442e-01
1.539137e-01

```

```

          s2          s3          s4          s5
s6
count  4.420000e+02  4.420000e+02  4.420000e+02  4.420000e+02
4.420000e+02
mean    1.327024e-16 -4.574646e-16  3.777301e-16 -3.830854e-16 -
3.412882e-16
std     4.761905e-02  4.761905e-02  4.761905e-02  4.761905e-02
4.761905e-02
min     -1.156131e-01 -1.023071e-01 -7.639450e-02 -1.260974e-01 -
1.377672e-01
25%     -3.035840e-02 -3.511716e-02 -3.949338e-02 -3.324879e-02 -
3.317903e-02
50%     -3.819065e-03 -6.584468e-03 -2.592262e-03 -1.947634e-03 -

```

```
1.077698e-03
75%      2.984439e-02  2.931150e-02  3.430886e-02  3.243323e-02
2.791705e-02
max      1.987880e-01  1.811791e-01  1.852344e-01  1.335990e-01
1.356118e-01
```

```
print(df.shape)
```

```
(442, 10)
```

```
a=df["bmi"] #accessing df columns for plotting
```

```
b=df["age"]
```

```
print(a,b)
```

```
0      0.061696
```

```
1     -0.051474
```

```
2      0.044451
```

```
3     -0.011595
```

```
4     -0.036385
```

```
...
```

```
437     0.019662
```

```
438    -0.015906
```

```
439    -0.015906
```

```
440     0.039062
```

```
441    -0.073030
```

```
Name: bmi, Length: 442, dtype: float64 0      0.038076
```

```
1     -0.001882
```

```
2      0.085299
```

```
3     -0.089063
```

```
4      0.005383
```

```
...
```

```
437     0.041708
```

```
438    -0.005515
```

```
439     0.041708
```

```
440    -0.045472
```

```
441    -0.045472
```

```
Name: age, Length: 442, dtype: float64
```

```
import matplotlib.pyplot as plt
```

```
plt.plot(a,b)
```

```
plt.xlabel("bmi")
```

```
plt.ylabel("age")
```

```
plt.show()
```


