

```
In [56]: import numpy as np
import pandas as pd
from scipy.stats import zscore
#from sklearn.feature_selection import VarianceThreshold

z=np.abs(zscore(df))
z
```

Out[56]:

	fixed acidity	citric acid	residual sugar	chlorides	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates
0	0.528360	1.391472	0.453218	0.243707	0.466193	0.379133	0.558274	1.288643	0.579207
1	0.298547	1.391472	0.043416	0.223875	0.872638	0.624363	0.028261	0.719933	0.128950
2	0.298547	1.186070	0.169427	0.096353	0.083669	0.229047	0.134264	0.331177	0.048089
3	1.654856	1.484154	0.453218	0.264960	0.107592	0.411500	0.664277	0.979104	0.461180
4	0.528360	1.391472	0.453218	0.243707	0.466193	0.379133	0.558274	1.288643	0.579207
...
1594	1.217796	0.980669	0.382271	0.053845	1.542054	0.075043	0.978765	0.899886	0.461180
1595	1.390155	0.877968	0.240375	0.541259	2.211469	0.137820	0.862162	1.353436	0.601055
1596	1.160343	0.723916	0.169427	0.243707	1.255161	0.196679	0.533554	0.705508	0.542042
1597	1.390155	0.775267	0.382271	0.264960	1.542054	0.075043	0.676657	1.677400	0.305990
1598	1.332702	1.021999	0.752894	0.434990	0.203223	0.135861	0.666057	0.511130	0.010924

1599 rows × 11 columns



```
In [57]: threshold = 3
print(np.where(z > 3))
```

```
(array([ 13,  14,  15,  15,  17,  17,  19,  33,  42,  43,  45,
        57,  81,  81,  83,  86,  88,  91,  92,  95, 106, 106,
       109, 142, 144, 147, 151, 151, 151, 151, 163, 164, 169,
       169, 181, 226, 226, 240, 243, 244, 258, 258, 274, 281,
       291, 324, 325, 339, 340, 347, 354, 374, 381, 391, 396,
       396, 400, 400, 442, 442, 451, 459, 467, 480, 480, 494,
       515, 517, 544, 554, 554, 555, 555, 557, 557, 568, 584,
       588, 591, 595, 608, 614, 636, 639, 649, 649, 651, 652,
       652, 652, 672, 684, 690, 692, 692, 695, 723, 730, 754,
       776, 777, 795, 821, 832, 836, 837, 889, 899, 911, 917,
       923, 925, 926, 982, 1017, 1018, 1043, 1051, 1051, 1071, 1074,
      1079, 1079, 1081, 1081, 1111, 1114, 1131, 1154, 1165, 1175, 1186,
      1231, 1235, 1244, 1244, 1244, 1260, 1269, 1269, 1270, 1270, 1288,
      1289, 1295, 1296, 1299, 1300, 1316, 1319, 1319, 1321, 1358, 1367,
      1370, 1370, 1372, 1372, 1374, 1374, 1434, 1434, 1434, 1435, 1435,
      1435, 1469, 1474, 1474, 1474, 1476, 1476, 1476, 1478, 1493, 1496,
      1505, 1558, 1558, 1570, 1574, 1589], dtype=int64), array([ 8,  4,  4,
        5,  3,  8,  3,  2,  3,  8,  7,  4,  3,  8,  3,  8,  8,
        8,  8,  7,  3,  8,  5,  9,  9,  3,  1,  3,  7,  8,  2,  2,  3,  8,
        3,  3,  8,  3,  0,  0,  3,  8,  2,  3,  3,  2,  2,  8,  8,  0,  5,
        0,  0,  0,  2,  4,  2,  4,  0,  6,  3, 10,  9,  2,  6,  2,  5, 10,
        0,  0,  6,  0,  6,  0,  6,  3,  4,  9,  5,  2,  6,  8,  5,  8,  2,
        5,  5,  0,  2,  9,  5,  5, 10,  3,  8,  7,  8,  3,  3,  3,  3,  8,
        9, 10,  6,  6,  6, 10,  2,  2,  2,  4,  4,  4,  6,  6,  2,  3,  8,
        2,  2,  2,  5,  2,  5,  7,  6,  4,  4,  3,  4,  2,  4,  2,  2,  4,
        5,  3,  6,  9,  6,  9,  8,  8,  4,  4, 10,  7,  7,  3,  8,  7,  4,
        8,  3,  8,  3,  8,  3, 10,  2,  4,  6,  2,  4,  6, 10,  2,  4,  6,
        2,  4,  6, 10,  5,  5, 10,  3,  4,  3,  2,  2], dtype=int64))
```

In [58]: `z[13][8]`

```
-----
KeyError                                Traceback (most recent call last)
C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\indexes\base.py in get_loc(self, key, method, tolerance)
    3360         try:
-> 3361             return self._engine.get_loc(casted_key)
    3362         except KeyError as err:

C:\ProgramData\Anaconda3\lib\site-packages\pandas\_libs\index.pyx in pandas._libs.index.IndexEngine.get_loc()

C:\ProgramData\Anaconda3\lib\site-packages\pandas\_libs\index.pyx in pandas._libs.index.IndexEngine.get_loc()

pandas\_libs\hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get_item()

pandas\_libs\hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get_item()

KeyError: 13
```

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

```
KeyError                                Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_10452\3160204710.py in <module>
----> 1 z[13][8]

C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\frame.py in __getitem__(self, key)
    3456         if self.columns.nlevels > 1:
    3457             return self._getitem_multilevel(key)
-> 3458         indexer = self.columns.get_loc(key)
    3459         if is_integer(indexer):
    3460             indexer = [indexer]

C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\indexes\base.py in get_loc(self, key, method, tolerance)
    3361         return self._engine.get_loc(casted_key)
    3362         except KeyError as err:
-> 3363             raise KeyError(key) from err
    3364
    3365         if is_scalar(key) and isna(key) and not self.hasnans:

KeyError: 13
```

In []:

