```
 1
 2 Shape of housing data
 3
 4 (506, 5)
 5 Percentage of entries in the matrix have the value NaN  0.
   0197628458498
 6
 7 Rows containing at least one NaN value?  50
 8
 9 Array of NaN values each column has is  [15  9 12  9  5]
10
11 Average value of each column, ignoring all rows containing
    at least one NaN value?
12
13 [  3.36968149  11.33588621  11.04236324   0.06345733   0.
   55297746]
14
15 Average value of each column, ignoring NaN values, but
   including other features in the same row as a NaN value \
   n
16 [  3.57906676  11.37826962  11.0838664    0.06438632   0.
   55475988]
17 Average petal length for each iris species \ n
18 [ 1.464  4.26   5.552]
19 Sepal width for the ↑ve data cases with the largest sepal
    length \ n
20 [ 2.8  2.6  3.8  3.   3.8]
21 Sepal measurements for the three data cases with the
   largest petal area according to this approximation.
22
23 4 by 4 Pearson correlation matrix
24
25 [[ 6.3  3.3]
26  [ 7.2  3.6]
27  [ 7.7  2.6]]
28 Z-score
29 [[ 1.38761598  0.66206514 -0.29022034 -0.83438346 -0.
   92507732]
30  [ 1.45692879  0.53420722 -0.24282147 -0.82559298 -0.
   92272157]
31  [ 1.39320853  0.65214017 -0.28654644 -0.82999657 -0.
   92880569]
```

```
32  [ 1.38678077  0.62201196 -0.19374143 -0.85654106 -0.
   95851024]
33  [ 1.35274096  0.71293105 -0.29248453 -0.84089303 -0.
   93229445]
34  [ 1.34801204  0.69992933 -0.25059198 -0.81226366 -0.
   98508572]
35  [ 1.3319995   0.73109747 -0.27040591 -0.82123277 -0.
   97145828]
36  [ 1.3876234   0.6425907  -0.24213563 -0.84747469 -0.
   94060378]
37  [ 1.40406401  0.60021057 -0.20364287 -0.84672563 -0.
   95390608]
38  [ 1.42683395  0.56498794 -0.2010974  -0.87142208 -0.
   91930241]
39  [ 1.38748169  0.65948204 -0.28263516 -0.83934078 -0.
   92498779]
40  [ 1.3502799   0.67513995 -0.19289713 -0.86803708 -0.
   96448564]
41  [ 1.43834515  0.55772567 -0.2250472  -0.86105016 -0.
   90997346]
42  [ 1.37703057  0.68851528 -0.31777628 -0.84740343 -0.
   90036614]
43  [ 1.39548838  0.68990437 -0.40767076 -0.79966188 -0.
   87806011]
44  [ 1.30802106  0.79274004 -0.35673302 -0.79274004 -0.
   95128804]
45  [ 1.36386479  0.72455317 -0.38358697 -0.76717394 -0.
   93765704]
46  [ 1.39148288  0.65912347 -0.30209826 -0.80559535 -0.
   94291274]
47  [ 1.40392824  0.6193801  -0.24775204 -0.82584014 -0.
   94971616]
48  [ 1.32734091  0.74438713 -0.28699263 -0.82510381 -0.
   95963161]
49  [ 1.43125698  0.55318521 -0.19317579 -0.85172961 -0.
   93953679]
50  [ 1.35062697  0.71181692 -0.29202745 -0.79394964 -0.
   9764668 ]
51  [ 1.30085481  0.82259937 -0.42086479 -0.80346915 -0.
   89912024]
52  [ 1.42195253  0.56305503 -0.20040942 -0.77300775 -1.
   01159039]
53  [ 1.32784608  0.64938458 -0.07753846 -0.90138456 -0.
   99830763]
54  [ 1.45790363  0.4987565  -0.17264648 -0.84404947 -0.
```

```
54 93996418]
55  [ 1.390161    0.62842894 -0.22851962 -0.79981866 -0.
   99025167]
56  [ 1.39712386  0.63587048 -0.25972174 -0.84185669 -0.
   93141591]
57  [ 1.4206014   0.61139807 -0.28771674 -0.82718562 -0.
   9170971 ]
58  [ 1.37519521  0.62780651 -0.16940811 -0.86697089 -0.
   96662272]
59  [ 1.41107733  0.57232507 -0.16775045 -0.85848761 -0.
   95716434]
60  [ 1.44953327  0.56024905 -0.28457095 -0.77367727 -0.
   95153411]
61  [ 1.27766679  0.81229147 -0.28768656 -0.87998243 -0.
   92228927]
62  [ 1.31312989  0.78625679 -0.34854682 -0.83489123 -0.
   91594863]
63  [ 1.42683395  0.56498794 -0.2010974  -0.87142208 -0.
   91930241]
64  [ 1.44044807  0.59862777 -0.33672812 -0.80440606 -0.
   89794165]
65  [ 1.44387016  0.59453477 -0.33973416 -0.80686862 -0.
   89180216]
66  [ 1.42683395  0.56498794 -0.2010974  -0.87142208 -0.
   91930241]
67  [ 1.38820733  0.64641715 -0.25432806 -0.8371632  -0.
   94313323]
68  [ 1.40210693  0.62315864 -0.24743063 -0.84309698 -0.
   93473795]
69  [ 1.38090291  0.68581755 -0.33364097 -0.79703121 -0.
   93604828]
70  [ 1.55188871  0.34119539 -0.20911976 -0.7594349  -0.
   92452944]
71  [ 1.34273052  0.7182047  -0.27062786 -0.84310986 -0.
   9471975 ]
72  [ 1.37633677  0.65448182 -0.25986778 -0.74110442 -1.
   0298464 ]
73  [ 1.30772324  0.71330359 -0.1554636  -0.84133244 -1.
   02423079]
74  [ 1.44819089  0.54931379 -0.24968808 -0.79900187 -0.
   94881472]
75  [ 1.31875048  0.73956952 -0.24058286 -0.86431619 -0.
   95342095]
76  [ 1.37170951  0.66568256 -0.24206638 -0.84723234 -0.
   94809334]
```

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77  [ 1.37352363  0.67806863 -0.278182   -0.84323919 -0.
   93017107]
78  [ 1.41238739  0.61733489 -0.27125321 -0.83246674 -0.
   92600233]
79  [ 1.43236516 -0.10520196  0.50173243 -0.83352323 -0.
   9953724 ]
80  [ 1.39182831 -0.05422708  0.53323292 -0.822444   -1.
   04839015]
81  [ 1.39830819 -0.15536758  0.5805841  -0.80954685 -1.
   01397787]
82  [ 1.40916076 -0.27341925  0.62045138 -0.7992255  -0.
   95696738]
83  [ 1.41519664 -0.21096099  0.58014272 -0.78231367 -1.
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84  [ 1.30174097 -0.12820176  0.71004053 -0.86782731 -1.
   01575242]
85  [ 1.33599622 -0.03660264  0.6039435  -0.81440866 -1.
   08892843]
86  [ 1.44123363 -0.07266724  0.47233707 -0.92045173 -0.
   92045173]
87  [ 1.41475275 -0.16192953  0.56249206 -0.84373808 -0.
   97157719]
88  [ 1.35288545 -0.08025592  0.60765194 -0.82548943 -1.
   05479205]
89  [ 1.44337567 -0.28867513  0.57735027 -0.8660254  -0.
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90  [ 1.38878534 -0.05994757  0.53952812 -0.80929218 -1.
   05907372]
91  [ 1.46889383 -0.29749749  0.53921419 -0.85530527 -0.
   85530527]
92  [ 1.32745678 -0.1474952   0.68216529 -0.83887893 -1.
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93  [ 1.4566088   0.01071036  0.38557292 -0.84611835 -1.
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94  [ 1.45089769 -0.09443713  0.46360045 -0.82417857 -0.
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95  [ 1.27271564 -0.06158302  0.70820467 -0.8313707  -1.
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96  [ 1.39258869 -0.1063783   0.57057453 -0.92839246 -0.
   92839246]
97  [ 1.41862154 -0.40012402  0.64565468 -0.7184045  -0.
   94574769]
98  [ 1.42293059 -0.16379057  0.55279318 -0.88037432 -0.
   93155888]
99  [ 1.25847538 -0.06882287  0.71772424 -0.75705159 -1.
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 99 15032515]
100  [ 1.46162409 -0.11463718  0.45854873 -0.83111958 -0.
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101  [ 1.34474644 -0.32520012  0.72950297 -0.76465974 -0.
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102  [ 1.32639827 -0.16241612  0.69478005 -0.88426552 -0.
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103  [ 1.44045998 -0.12525739  0.50102956 -0.8410139  -0.
    97521825]
104  [ 1.44594037 -0.12194678  0.48778711 -0.81878551 -0.
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105  [ 1.41526641 -0.23039221  0.5924371  -0.80637272 -0.
    97093858]
106  [ 1.36595274 -0.20362028  0.64479757 -0.75509189 -1.
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107  [ 1.35411141 -0.13445078  0.63383938 -0.80670467 -1.
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108  [ 1.49777931 -0.0815118   0.37699207 -0.89662979 -0.
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109  [ 1.43555877 -0.18861356  0.54488362 -0.86971809 -0.
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110  [ 1.44976624 -0.16687957  0.51106867 -0.89697767 -0.
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111  [ 1.44234572 -0.11017919  0.4907982  -0.86140092 -0.
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112  [ 1.24579427 -0.26564731  0.83358293 -0.76946117 -1.
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113  [ 1.23011596 -0.04241779  0.7529158  -0.83775138 -1.
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114  [ 1.31278492  0.04862166  0.58345997 -0.82656829 -1.
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115  [ 1.40584727 -0.1278043   0.55381862 -0.80942721 -1.
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116  [ 1.44135302 -0.33809515  0.59611514 -0.78295719 -0.
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117  [ 1.34894406  0.          0.5707071  -0.88200188 -1.
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118  [ 1.39664946 -0.1904522   0.60309863 -0.82529286 -0.
    98400303]
119  [ 1.2966389  -0.17220985  0.73948937 -0.88130926 -0.
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120  [ 1.33960734 -0.10233112  0.64189518 -0.84655741 -1.
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121  [ 1.43073028 -0.15897003  0.53652386 -0.85446392 -0.
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122  [ 1.46722447 -0.13015701  0.46146576 -0.89926661 -0.
    89926661]
123  [ 1.35554052 -0.1335002   0.63669328 -0.85234745 -1.
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124  [ 1.34134201 -0.01001002  0.59059089 -0.91091137 -1.
    01101152]
125  [ 1.3558545  -0.0607099   0.59698071 -0.87017528 -1.
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126  [ 1.41403236 -0.1109045   0.53603841 -0.85026782 -0.
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127  [ 1.52907369 -0.02389178  0.27475543 -0.86010395 -0.
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128  [ 1.38498186 -0.09165321  0.57028665 -0.85542997 -1.
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129  [ 1.13900381 -0.35968541  0.98913489 -0.75933587 -1.
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130  [ 1.26133954 -0.4387268   0.8774536  -0.8774536  -0.
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131  [ 1.31848059 -0.43663967  0.80478685 -0.82190998 -0.
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132  [ 1.23319408 -0.39194541  0.89860654 -0.91772583 -0.
    82212939]
133  [ 1.23669388 -0.42808634  0.90373784 -0.80860754 -0.
    90373784]
134  [ 1.26258172 -0.47630328  0.88456324 -0.81651992 -0.
    85432176]
135  [ 1.20501549 -0.4197245   0.93422549 -0.96130449 -0.
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136  [ 1.26568294 -0.45314574  0.87504006 -0.88285291 -0.
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137  [ 1.27309713 -0.54561306  0.88337352 -0.84873142 -0.
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138  [ 1.28458729 -0.29915046  0.80066742 -0.78307033 -1.
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139  [ 1.37812038 -0.28165964  0.67397128 -0.88521601 -0.
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140  [ 1.33019113 -0.46605237  0.79617279 -0.85442934 -0.
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141  [ 1.3530995  -0.40778341  0.75069219 -0.82483462 -0.
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142  [ 1.27478296 -0.53021946  0.87993868 -0.81225109 -0.
    81225109]
143  [ 1.27313516 -0.4788857   0.86433029 -0.71248848 -0.
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144  [ 1.32854874 -0.33213718  0.75768795 -0.7992051  -0.
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144 9548944 ]
145  [ 1.28978671 -0.35775106  0.81906163 -0.92262115 -0.
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146  [ 1.23690723 -0.26121022  0.85277455 -0.87582251 -0.
    95264905]
147  [ 1.23128615 -0.61564307  0.94157176 -0.72428597 -0.
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148  [ 1.31721912 -0.56452248  0.82202396 -0.91115909 -0.
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149  [ 1.32745678 -0.37795644  0.77434979 -0.79278669 -0.
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150  [ 1.27030374 -0.39177592  0.85478383 -0.86665582 -0.
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151  [ 1.260643   -0.52466067  0.89629531 -0.81613882 -0.
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152  [ 1.39883626 -0.42573277  0.68928163 -0.88187503 -0.
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153  [ 1.28199849 -0.30880256  0.81411583 -0.87026175 -0.
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154  [ 1.29787535 -0.34500484  0.80501129 -0.92001291 -0.
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155  [ 1.40239195 -0.37676202  0.66979914 -0.90004259 -0.
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156  [ 1.353248   -0.29835389  0.71391824 -0.93768366 -0.
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157  [ 1.26612901 -0.47359024  0.87952473 -0.81186898 -0.
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158  [ 1.33328927 -0.37397138  0.76420239 -0.94305826 -0.
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159  [ 1.32269114 -0.48813602  0.81093564 -0.84242829 -0.
    80306248]
160  [ 1.3123202  -0.23380417  0.74666494 -0.91259048 -0.
    91259048]
161  [ 1.26867009 -0.48795004  0.87831007 -0.78072006 -0.
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162  [ 1.33362904 -0.35756721  0.75379033 -0.98572581 -0.
    74412635]
163  [ 1.18615167 -0.43554006  0.95448142 -0.99154866 -0.
    71354436]
164  [ 1.37163162 -0.48085936  0.74099639 -0.75676228 -0.
    87500638]
165  [ 1.22890001 -0.28118898  0.86439577 -0.80190933 -1.
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166  [ 1.26680279 -0.3167007   0.8349382  -0.9405051  -0.
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167  [ 1.35862369 -0.28487271  0.70122513 -0.94227127 -0.
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168  [ 1.3860103  -0.36960275  0.69300515 -0.83160618 -0.
    87780652]
169  [ 1.32088464 -0.41458423  0.79060248 -0.75203651 -0.
    94486638]
170  [ 1.45434542 -0.37562564  0.58751702 -0.7608827  -0.
    9053541 ]
171  [ 1.26133954 -0.4387268   0.8774536  -0.8774536  -0.
    82261275]
172  [ 1.267309   -0.38570274  0.85405607 -0.79895568 -0.
    93670665]
173  [ 1.29364212 -0.3598854   0.8073105  -0.7489507  -0.
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174  [ 1.40850815 -0.41368771  0.6697801  -0.75842747 -0.
    90617308]
175  [ 1.38468121 -0.52176393  0.73247629 -0.82278159 -0.
    77261198]
176  [ 1.36506596 -0.36599595  0.72210011 -0.86058506 -0.
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177  [ 1.25293234 -0.24630294  0.8245794  -0.83528823 -0.
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178  [ 1.26477248 -0.30268059  0.83237163 -0.95128187 -0.
    84318165]]
179
180 Process finished with exit code 0
181
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