

```
1 C:\Users\vince\anaconda3\python.exe "D:/
  Documents/Choses école/UQAC/Session7/8INF436-
  Forage_de_donnees/TP3/main.py"
2 2021-04-07 09:46:28.025393: W tensorflow/
  stream_executor/platform/default/dso_loader.
  cc:60] Could not load dynamic library '
  cudart64_110.dll'; dlerror: cudart64_110.dll
  not found
3 2021-04-07 09:46:28.025495: I tensorflow/
  stream_executor/cuda/cudart_stub.cc:29]
  Ignore above cudart dlerror if you do not
  have a GPU set up on your machine.
4 Missing values per attribute:
5 id                                0
6 gender                            0
7 age                               0
8 hypertension                       0
9 heart_disease                     0
10 ever_married                     0
11 work_type                         0
12 Residence_type                    0
13 avg_glucose_level                 0
14 bmi                               0
15 smoking_status                    0
16 stroke                            0
17 dtype: int64
18 C:\Users\vince\anaconda3\lib\site-packages\
  pandas\core\indexing.py:1736:
  SettingWithCopyWarning:
19 A value is trying to be set on a copy of a
  slice from a DataFrame.
20 Try using .loc[row_indexer,col_indexer] =
  value instead
21
22 See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy
```

```

23  isetter(loc, value[:, i].tolist())
24  <class 'pandas.core.frame.DataFrame'>
25  Int64Index: 4860 entries, 0 to 5109
26  Data columns (total 10 columns):
27  #      Column              Non-Null Count  Dtype
28  ---  -
29  0     gender              4860 non-null
      float64
30  1     age                4860 non-null
      float64
31  2     hypertension       4860 non-null
      float64
32  3     heart_disease      4860 non-null
      float64
33  4     ever_married       4860 non-null
      float64
34  5     work_type          4860 non-null
      float64
35  6     Residence_type     4860 non-null
      float64
36  7     avg_glucose_level  4860 non-null
      float64
37  8     bmi                4860 non-null
      float64
38  9     smoking_status     4860 non-null
      float64
39  dtypes: float64(10)
40  memory usage: 417.7 KB
41  None
42
43  Auto-encodeurs linéaires trop complets à 2
      couches avec sparsity
44  La couche 1 possède 11 unités
45  2021-04-07 09:46:29.812878: I tensorflow/
      compiler/jit/xla_cpu_device.cc:41] Not
      creating XLA devices,

```

```
45 tf_xla_enable_xla_devices not set
46 2021-04-07 09:46:29.813340: I tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:49] Successfully opened dynamic library
    nvcuda.dll
47 2021-04-07 09:46:29.837721: I tensorflow/core
    /common_runtime/gpu/gpu_device.cc:1720] Found
    device 0 with properties:
48 pciBusID: 0000:08:00.0 name: GeForce RTX 2080
    computeCapability: 7.5
49 coreClock: 1.71GHz coreCount: 46
    deviceMemorySize: 8.00GiB
    deviceMemoryBandwidth: 417.23GiB/s
50 2021-04-07 09:46:29.838428: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cudart64_110.dll'; dlerror: cudart64_110.dll
    not found
51 2021-04-07 09:46:29.838959: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cublas64_11.dll'; dlerror: cublas64_11.dll
    not found
52 2021-04-07 09:46:29.839475: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cublasLt64_11.dll'; dlerror: cublasLt64_11.
    dll not found
53 2021-04-07 09:46:29.839997: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cufft64_10.dll'; dlerror: cufft64_10.dll not
    found
54 2021-04-07 09:46:29.840508: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    curand64_10.dll'; dlerror: curand64_10.dll
    not found
```

```
55 2021-04-07 09:46:29.841028: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cusolver64_10.dll'; dlerror: cusolver64_10.
    dll not found
56 2021-04-07 09:46:29.841546: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cusparse64_11.dll'; dlerror: cusparse64_11.
    dll not found
57 2021-04-07 09:46:29.842062: W tensorflow/
    stream_executor/platform/default/dso_loader.
    cc:60] Could not load dynamic library '
    cudnn64_8.dll'; dlerror: cudnn64_8.dll not
    found
58 2021-04-07 09:46:29.842147: W tensorflow/core
    /common_runtime/gpu/gpu_device.cc:1757]
    Cannot dlopen some GPU libraries. Please make
    sure the missing libraries mentioned above
    are installed properly if you would like to
    use GPU. Follow the guide at https://www.
    tensorflow.org/install/gpu for how to
    download and setup the required libraries for
    your platform.
59 Skipping registering GPU devices...
60 2021-04-07 09:46:29.842720: I tensorflow/core
    /platform/cpu_feature_guard.cc:142] This
    TensorFlow binary is optimized with oneAPI
    Deep Neural Network Library (oneDNN) to use
    the following CPU instructions in performance
    -critical operations:  AVX2
61 To enable them in other operations, rebuild
    TensorFlow with the appropriate compiler
    flags.
62 2021-04-07 09:46:29.843312: I tensorflow/core
    /common_runtime/gpu/gpu_device.cc:1261]
    Device interconnect StreamExecutor with
    strength 1 edge matrix:
```

```
63 2021-04-07 09:46:29.843407: I tensorflow/
    core/common_runtime/gpu/gpu_device.cc:1267
    ]
64 2021-04-07 09:46:29.843458: I tensorflow/
    compiler/jit/xla_gpu_device.cc:99] Not
    creating XLA devices,
    tf_xla_enable_xla_devices not set
65 2021-04-07 09:46:29.905742: I tensorflow/
    compiler/mlir/mlir_graph_optimization_pass.
    cc:116] None of the MLIR optimization passes
    are enabled (registered 2)
66 23/23 [=====] - 0s
    318us/step
67 23/23 [=====] - 0s
    364us/step
68 23/23 [=====] - 0s
    409us/step
69 23/23 [=====] - 0s
    364us/step
70 23/23 [=====] - 0s
    318us/step
71 23/23 [=====] - 0s
    318us/step
72 23/23 [=====] - 0s
    318us/step
73 23/23 [=====] - 0s
    273us/step
74 23/23 [=====] - 0s
    273us/step
75 23/23 [=====] - 0s
    318us/step
76 La couche 1 possède 12 unités
77 23/23 [=====] - 0s
    273us/step
78 23/23 [=====] - 0s
    318us/step
79 23/23 [=====] - 0s
    454us/step
```

```
80 23/23 [=====] - 0s
    318us/step
81 23/23 [=====] - 0s
    318us/step
82 23/23 [=====] - 0s
    318us/step
83 23/23 [=====] - 0s
    318us/step
84 23/23 [=====] - 0s
    409us/step
85 23/23 [=====] - 0s
    409us/step
86 23/23 [=====] - 0s
    364us/step
87 La couche 1 possède 13 unités
88 23/23 [=====] - 0s
    318us/step
89 23/23 [=====] - 0s
    409us/step
90 23/23 [=====] - 0s
    364us/step
91 23/23 [=====] - 0s
    409us/step
92 23/23 [=====] - 0s
    455us/step
93 23/23 [=====] - 0s
    409us/step
94 23/23 [=====] - 0s
    364us/step
95 23/23 [=====] - 0s
    409us/step
96 23/23 [=====] - 0s
    318us/step
97 23/23 [=====] - 0s
    318us/step
98 La couche 1 possède 14 unités
99 23/23 [=====] - 0s
    364us/step
```

```
100 23/23 [=====] - 0s
    364us/step
101 23/23 [=====] - 0s
    364us/step
102 23/23 [=====] - 0s
    318us/step
103 23/23 [=====] - 0s
    409us/step
104 23/23 [=====] - 0s
    273us/step
105 23/23 [=====] - 0s
    409us/step
106 23/23 [=====] - 0s
    318us/step
107 23/23 [=====] - 0s
    364us/step
108 23/23 [=====] - 0s
    364us/step
109 La couche 1 possède 15 unités
110 23/23 [=====] - 0s
    364us/step
111 23/23 [=====] - 0s
    409us/step
112 23/23 [=====] - 0s
    364us/step
113 23/23 [=====] - 0s
    364us/step
114 23/23 [=====] - 0s
    364us/step
115 23/23 [=====] - 0s
    318us/step
116 23/23 [=====] - 0s
    364us/step
117 23/23 [=====] - 0s
    409us/step
118 23/23 [=====] - 0s
    364us/step
119 23/23 [=====] - 0s
```

```
119 409us/step
120 La couche 1 possède 16 unités
121 23/23 [=====] - 0s
    364us/step
122 23/23 [=====] - 0s
    409us/step
123 23/23 [=====] - 0s
    455us/step
124 23/23 [=====] - 0s
    364us/step
125 23/23 [=====] - 0s
    318us/step
126 23/23 [=====] - 0s
    364us/step
127 23/23 [=====] - 0s
    318us/step
128 23/23 [=====] - 0s
    273us/step
129 23/23 [=====] - 0s
    364us/step
130 23/23 [=====] - 0s
    364us/step
131 La couche 1 possède 17 unités
132 23/23 [=====] - 0s
    318us/step
133 23/23 [=====] - 0s
    364us/step
134 23/23 [=====] - 0s
    273us/step
135 23/23 [=====] - 0s
    364us/step
136 23/23 [=====] - 0s
    318us/step
137 23/23 [=====] - 0s
    318us/step
138 23/23 [=====] - 0s
    364us/step
139 23/23 [=====] - 0s
```



```
139 364us/step
140 23/23 [=====] - 0s
    318us/step
141 23/23 [=====] - 0s
    364us/step
142 La couche 1 possède 18 unités
143 23/23 [=====] - 0s
    364us/step
144 23/23 [=====] - 0s
    364us/step
145 23/23 [=====] - 0s
    364us/step
146 23/23 [=====] - 0s
    364us/step
147 23/23 [=====] - 0s
    364us/step
148 23/23 [=====] - 0s
    364us/step
149 23/23 [=====] - 0s
    318us/step
150 23/23 [=====] - 0s
    363us/step
151 23/23 [=====] - 0s
    409us/step
152 23/23 [=====] - 0s
    318us/step
153 La couche 1 possède 19 unités
154 23/23 [=====] - 0s
    318us/step
155 23/23 [=====] - 0s
    363us/step
156 23/23 [=====] - 0s
    364us/step
157 23/23 [=====] - 0s
    364us/step
158 23/23 [=====] - 0s
    364us/step
159 23/23 [=====] - 0s
```

```
159 409us/step
160 23/23 [=====] - 0s
    409us/step
161 23/23 [=====] - 0s
    409us/step
162 23/23 [=====] - 0s
    318us/step
163 23/23 [=====] - 0s
    364us/step
164 La couche 1 possède 20 unités
165 23/23 [=====] - 0s
    318us/step
166 23/23 [=====] - 0s
    364us/step
167 23/23 [=====] - 0s
    364us/step
168 23/23 [=====] - 0s
    364us/step
169 23/23 [=====] - 0s
    364us/step
170 23/23 [=====] - 0s
    364us/step
171 23/23 [=====] - 0s
    409us/step
172 23/23 [=====] - 0s
    318us/step
173 23/23 [=====] - 0s
    318us/step
174 23/23 [=====] - 0s
    364us/step
175 La couche 1 possède 21 unités
176 23/23 [=====] - 0s
    409us/step
177 23/23 [=====] - 0s
    409us/step
178 23/23 [=====] - 0s
    364us/step
179 23/23 [=====] - 0s
```

```
179 364us/step
180 23/23 [=====] - 0s
    409us/step
181 23/23 [=====] - 0s
    409us/step
182 23/23 [=====] - 0s
    409us/step
183 23/23 [=====] - 0s
    364us/step
184 23/23 [=====] - 0s
    409us/step
185 23/23 [=====] - 0s
    364us/step
186 La couche 1 possède 22 unités
187 23/23 [=====] - 0s
    364us/step
188 23/23 [=====] - 0s
    409us/step
189 23/23 [=====] - 0s
    364us/step
190 23/23 [=====] - 0s
    364us/step
191 23/23 [=====] - 0s
    409us/step
192 23/23 [=====] - 0s
    364us/step
193 23/23 [=====] - 0s
    318us/step
194 23/23 [=====] - 0s
    363us/step
195 23/23 [=====] - 0s
    409us/step
196 23/23 [=====] - 0s
    364us/step
197 La couche 1 possède 23 unités
198 23/23 [=====] - 0s
    364us/step
199 23/23 [=====] - 0s
```

```
199 409us/step
200 23/23 [=====] - 0s
    364us/step
201 23/23 [=====] - 0s
    318us/step
202 23/23 [=====] - 0s
    318us/step
203 23/23 [=====] - 0s
    364us/step
204 23/23 [=====] - 0s
    364us/step
205 23/23 [=====] - 0s
    364us/step
206 23/23 [=====] - 0s
    364us/step
207 23/23 [=====] - 0s
    409us/step
208 La couche 1 possède 24 unités
209 23/23 [=====] - 0s
    318us/step
210 23/23 [=====] - 0s
    364us/step
211 23/23 [=====] - 0s
    364us/step
212 23/23 [=====] - 0s
    364us/step
213 23/23 [=====] - 0s
    409us/step
214 23/23 [=====] - 0s
    318us/step
215 23/23 [=====] - 0s
    318us/step
216 23/23 [=====] - 0s
    318us/step
217 23/23 [=====] - 0s
    318us/step
218 23/23 [=====] - 0s
    364us/step
```

```
219 Scores moyens(précision moyenne et écart-
    type) pour les auto-encodeurs linéaires trop
    complets à 2 couches avec sparsity:
220 {11: (0.16925050279722936, 0.3606), 12: (0.
    1743119514936462, 0.2009), 13: (0.
    1904342931723385, 0.1966), 14: (0.
    1661847411345439, 0.1975), 15: (0.
    17560581065772968, 0.1564), 16: (0.
    17836883603981674, 0.229), 17: (0.
    16015677729016248, 0.1433), 18: (0.
    1781894518027725, 0.2385), 19: (0.
    17141996744215202, 0.1396), 20: (0.
    18773671434557884, 0.2174), 21: (0.
    151343157577689, 0.1531), 22: (0.
    16308119673217064, 0.1542), 23: (0.
    1700588306386444, 0.1488), 24: (0.
    18865730600313738, 0.1795)}
221
222 Process finished with exit code 0
223
```