```
 1 C:\Users\vince\anaconda3\python.exe "D:/
   Documents/Choses école/UQAC/Session7/8INF436-
   Forage_de_donnees/TP3/main.py"
 2 2021-04-07 09:46:54.561165: 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 09:46:54.561282: 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 2021-04-07 09:46:56.900264: I tensorflow/
   compiler/jit/xla_cpu_device.cc:41] Not
   creating XLA devices,
   tf_xla_enable_xla_devices not set
43 2021-04-07 09:46:56.900959: I tensorflow/
   stream_executor/platform/default/dso_loader.
   cc:49] Successfully opened dynamic library
```

43 nvcuda.dll

44

45 Auto-encodeurs linéaires trop complets à 2 couches avec sparsity et dropout de 0.05

46 La couche 1 possède 11 unités

47 2021-04-07 09:46:56.926349: 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 09:46:56.927148: 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 09:46:56.927845: 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 09:46:56.928380: 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 09:46:56.928959: 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 09:46:56.929494: 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 09:46:56.930229: 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 09:46:56.930812: 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 09:46:56.931339: 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 09:46:56.931428: 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 09:46:56.931955: 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 09:46:56.932740: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1261] Device interconnect StreamExecutor with strength 1 edge matrix:

63 2021-04-07 09:46:56.932863: I tensorflow/
   core/common_runtime/gpu/gpu_device.cc:1267
   ]
64 2021-04-07 09:46:56.932933: I tensorflow/
   compiler/jit/xla_gpu_device.cc:99] Not
   creating XLA devices,
   tf_xla_enable_xla_devices not set
65 2021-04-07 09:46:57.015632: I tensorflow/
   compiler/mlir/mlir_graph_optimization_pass.
   cc:116] None of the MLIR optimization passes
    are enabled (registered 2)
66 23/23 [==============================] - 0s
   364us/step
67 23/23 [==============================] - 0s
   409us/step
68 23/23 [==============================] - 0s
   409us/step
69 23/23 [==============================] - 0s
   409us/step
70 23/23 [==============================] - 0s
   273us/step
71 23/23 [==============================] - 0s
   364us/step
72 23/23 [==============================] - 0s
   318us/step
73 23/23 [==============================] - 0s
   364us/step
74 23/23 [==============================] - 0s
   318us/step
75 23/23 [==============================] - 0s
   409us/step
76 La couche 1 possède 12 unités
77 23/23 [==============================] - 0s
   364us/step
78 23/23 [==============================] - 0s
   318us/step
79 23/23 [==============================] - 0s
   364us/step

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80 23/23 [==============================] - 0s
   318us/step
81 23/23 [==============================] - 0s
   318us/step
82 23/23 [==============================] - 0s
   364us/step
83 23/23 [==============================] - 0s
   409us/step
84 23/23 [==============================] - 0s
   364us/step
85 23/23 [==============================] - 0s
   364us/step
86 23/23 [==============================] - 0s
   409us/step
87 La couche 1 possède 13 unités
88 23/23 [==============================] - 0s
   364us/step
89 23/23 [==============================] - 0s
   364us/step
90 23/23 [==============================] - 0s
   364us/step
91 23/23 [==============================] - 0s
   318us/step
92 23/23 [==============================] - 0s
   363us/step
93 23/23 [==============================] - 0s
   364us/step
94 23/23 [==============================] - 0s
   364us/step
95 23/23 [==============================] - 0s
   409us/step
96 23/23 [==============================] - 0s
   364us/step
97 23/23 [==============================] - 0s
   409us/step
98 La couche 1 possède 14 unités
99 23/23 [==============================] - 0s
   318us/step
```

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

```
119 318us/step
120 La couche 1 possède 16 unités
121 23/23 [==============================] - 0s
    364us/step
122 23/23 [==============================] - 0s
    364us/step
123 23/23 [==============================] - 0s
    364us/step
124 23/23 [==============================] - 0s
    409us/step
125 23/23 [==============================] - 0s
    364us/step
126 23/23 [==============================] - 0s
    318us/step
127 23/23 [==============================] - 0s
    364us/step
128 23/23 [==============================] - 0s
    364us/step
129 23/23 [==============================] - 0s
    409us/step
130 23/23 [==============================] - 0s
    364us/step
131 La couche 1 possède 17 unités
132 23/23 [==============================] - 0s
    409us/step
133 23/23 [==============================] - 0s
    364us/step
134 23/23 [==============================] - 0s
    352us/step
135 23/23 [==============================] - 0s
    318us/step
136 23/23 [==============================] - 0s
    318us/step
137 23/23 [==============================] - 0s
    273us/step
138 23/23 [==============================] - 0s
    318us/step
139 23/23 [==============================] - 0s
```

```
139 318us/step
140 23/23 [==============================] - 0s
    364us/step
141 23/23 [==============================] - 0s
    318us/step
142 La couche 1 possède 18 unités
143 23/23 [==============================] - 0s
    364us/step
144 23/23 [==============================] - 0s
    318us/step
145 23/23 [==============================] - 0s
    364us/step
146 23/23 [==============================] - 0s
    364us/step
147 23/23 [==============================] - 0s
    273us/step
148 23/23 [==============================] - 0s
    364us/step
149 23/23 [==============================] - 0s
    364us/step
150 23/23 [==============================] - 0s
    318us/step
151 23/23 [==============================] - 0s
    364us/step
152 23/23 [==============================] - 0s
    484us/step
153 La couche 1 possède 19 unités
154 23/23 [==============================] - 0s
    409us/step
155 23/23 [==============================] - 0s
    409us/step
156 23/23 [==============================] - 0s
    318us/step
157 23/23 [==============================] - 0s
    409us/step
158 23/23 [==============================] - 0s
    409us/step
159 23/23 [==============================] - 0s
```

```
159 364us/step
160 23/23 [==============================] - 0s
    364us/step
161 23/23 [==============================] - 0s
    364us/step
162 23/23 [==============================] - 0s
    409us/step
163 23/23 [==============================] - 0s
    409us/step
164 La couche 1 possède 20 unités
165 23/23 [==============================] - 0s
    409us/step
166 23/23 [==============================] - 0s
    409us/step
167 23/23 [==============================] - 0s
    409us/step
168 23/23 [==============================] - 0s
    455us/step
169 23/23 [==============================] - 0s
    364us/step
170 23/23 [==============================] - 0s
    364us/step
171 23/23 [==============================] - 0s
    409us/step
172 23/23 [==============================] - 0s
    409us/step
173 23/23 [==============================] - 0s
    409us/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
    636us/step
179 23/23 [==============================] - 0s
```

```
179 454us/step
180 23/23 [==============================] - 0s
    364us/step
181 23/23 [==============================] - 0s
    318us/step
182 23/23 [==============================] - 0s
    364us/step
183 23/23 [==============================] - 0s
    318us/step
184 23/23 [==============================] - 0s
    364us/step
185 23/23 [==============================] - 0s
    318us/step
186 La couche 1 possède 22 unités
187 23/23 [==============================] - 0s
    318us/step
188 23/23 [==============================] - 0s
    365us/step
189 23/23 [==============================] - 0s
    318us/step
190 23/23 [==============================] - 0s
    318us/step
191 23/23 [==============================] - 0s
    318us/step
192 23/23 [==============================] - 0s
    347us/step
193 23/23 [==============================] - 0s
    318us/step
194 23/23 [==============================] - 0s
    318us/step
195 23/23 [==============================] - 0s
    318us/step
196 23/23 [==============================] - 0s
    318us/step
197 La couche 1 possède 23 unités
198 23/23 [==============================] - 0s
    318us/step
199 23/23 [==============================] - 0s
```

```
199 273us/step
200 23/23 [==============================] - 0s
    318us/step
201 23/23 [==============================] - 0s
    364us/step
202 23/23 [==============================] - 0s
    364us/step
203 23/23 [==============================] - 0s
    318us/step
204 23/23 [==============================] - 0s
    364us/step
205 23/23 [==============================] - 0s
    318us/step
206 23/23 [==============================] - 0s
    318us/step
207 23/23 [==============================] - 0s
    318us/step
208 La couche 1 possède 24 unités
209 23/23 [==============================] - 0s
    273us/step
210 23/23 [==============================] - 0s
    318us/step
211 23/23 [==============================] - 0s
    318us/step
212 23/23 [==============================] - 0s
    318us/step
213 23/23 [==============================] - 0s
    273us/step
214 23/23 [==============================] - 0s
    318us/step
215 23/23 [==============================] - 0s
    318us/step
216 23/23 [==============================] - 0s
    273us/step
217 23/23 [==============================] - 0s
    273us/step
218 23/23 [==============================] - 0s
    318us/step
```

219 Scores moyens(précision moyenne et écart-
    type) pour les auto-encodeurs linéaires trop
     complets complets à 2 couches avec sparsity
     et dropout:
220 {11: (0.18086522195183455, 0.2898), 12: (0.
    18560573763405686, 0.1917), 13: (0.
    21449585610808114, 0.1356), 14: (0.
    19203013141357195, 0.3405), 15: (0.
    23906679657668972, 0.179), 16: (0.
    24303251291997605, 0.1304), 17: (0.
    1946238351986439, 0.1288), 18: (0.
    19494821040908175, 0.2589), 19: (0.
    21471144061970554, 0.2388), 20: (0.
    199145017413168, 0.1566), 21: (0.
    19894335134193558, 0.1648), 22: (0.
    1981209666253303, 0.1842), 23: (0.
    19785764230427122, 0.1936), 24: (0.
    1733837097065413, 0.3093)}
221
222 Process finished with exit code 0
223