```
 1 C:\Users\vince\anaconda3\python.exe "D:/
   Documents/Choses école/UQAC/Session7/8INF436-
   Forage_de_donnees/TP3/main.py"
 2 2021-04-06 11:38:31.341888: 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 2021-04-06 11:38:31.341986: 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 incomplets à 2
   couches avec sparsity
44 La couche 1 possède 2 unités
45 2021-04-06 11:38:33.174763: I tensorflow/
   compiler/jit/xla_cpu_device.cc:41] Not
   creating XLA devices,
```

45 tf_xla_enable_xla_devices not set

46 2021-04-06 11:38:33.175206: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library nvcuda.dll

47 2021-04-06 11:38:33.196260: 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 2021-04-06 11:38:33.197080: 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 2021-04-06 11:38:33.197693: 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 2021-04-06 11:38:33.198320: 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 2021-04-06 11:38:33.198857: 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 2021-04-06 11:38:33.199377: 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 2021-04-06 11:38:33.199901: 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 2021-04-06 11:38:33.200414: 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 2021-04-06 11:38:33.200930: 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 2021-04-06 11:38:33.201017: 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 2021-04-06 11:38:33.201528: 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 2021-04-06 11:38:33.202161: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1261] Device interconnect StreamExecutor with strength 1 edge matrix:

63 2021-04-06 11:38:33.202251: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1267]

64 2021-04-06 11:38:33.202309: I tensorflow/compiler/jit/xla_gpu_device.cc:99] Not creating XLA devices, tf_xla_enable_xla_devices not set

65 2021-04-06 11:38:33.265008: 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 318us/step

68 23/23 [==============================] - 0s 318us/step

69 23/23 [==============================] - 0s 364us/step

70 23/23 [==============================] - 0s 273us/step

71 23/23 [==============================] - 0s 318us/step

72 23/23 [==============================] - 0s 318us/step

73 23/23 [==============================] - 0s 273us/step

74 23/23 [==============================] - 0s 318us/step

75 23/23 [==============================] - 0s 318us/step

76 La couche 1 possède 3 unités

77 23/23 [==============================] - 0s 318us/step

78 23/23 [==============================] - 0s 318us/step

79 23/23 [==============================] - 0s 318us/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
   318us/step
85 23/23 [=============================] - 0s
   364us/step
86 23/23 [=============================] - 0s
   364us/step
87 La couche 1 possède 4 unités
88 23/23 [=============================] - 0s
   409us/step
89 23/23 [=============================] - 0s
   364us/step
90 23/23 [=============================] - 0s
   318us/step
91 23/23 [=============================] - 0s
   364us/step
92 23/23 [=============================] - 0s
   318us/step
93 23/23 [=============================] - 0s
   409us/step
94 23/23 [=============================] - 0s
   364us/step
95 23/23 [=============================] - 0s
   318us/step
96 23/23 [=============================] - 0s
   318us/step
97 23/23 [=============================] - 0s
   364us/step
98 La couche 1 possède 5 unités
99 23/23 [=============================] - 0s
   273us/step
```

```
100 23/23 [==============================] - 0s
    318us/step
101 23/23 [==============================] - 0s
    318us/step
102 23/23 [==============================] - 0s
    318us/step
103 23/23 [==============================] - 0s
    364us/step
104 23/23 [==============================] - 0s
    364us/step
105 23/23 [==============================] - 0s
    318us/step
106 23/23 [==============================] - 0s
    318us/step
107 23/23 [==============================] - 0s
    318us/step
108 23/23 [==============================] - 0s
    364us/step
109 La couche 1 possède 6 unités
110 23/23 [==============================] - 0s
    318us/step
111 23/23 [==============================] - 0s
    409us/step
112 23/23 [==============================] - 0s
    318us/step
113 23/23 [==============================] - 0s
    318us/step
114 23/23 [==============================] - 0s
    318us/step
115 23/23 [==============================] - 0s
    318us/step
116 23/23 [==============================] - 0s
    318us/step
117 23/23 [==============================] - 0s
    364us/step
118 23/23 [==============================] - 0s
    273us/step
119 23/23 [==============================] - 0s
```

119 318us/step
120 La couche 1 possède 7 unités
121 23/23 [==============================] - 0s
318us/step
122 23/23 [==============================] - 0s
364us/step
123 23/23 [==============================] - 0s
318us/step
124 23/23 [==============================] - 0s
273us/step
125 23/23 [==============================] - 0s
318us/step
126 23/23 [==============================] - 0s
364us/step
127 23/23 [==============================] - 0s
318us/step
128 23/23 [==============================] - 0s
318us/step
129 23/23 [==============================] - 0s
364us/step
130 23/23 [==============================] - 0s
318us/step
131 La couche 1 possède 8 unités
132 23/23 [==============================] - 0s
318us/step
133 23/23 [==============================] - 0s
318us/step
134 23/23 [==============================] - 0s
318us/step
135 23/23 [==============================] - 0s
318us/step
136 23/23 [==============================] - 0s
273us/step
137 23/23 [==============================] - 0s
318us/step
138 23/23 [==============================] - 0s
273us/step
139 23/23 [==============================] - 0s

```
139 318us/step
140 23/23 [==============================] - 0s
    318us/step
141 23/23 [==============================] - 0s
    273us/step
142 Scores moyens(précision moyenne et écart-
    type) pour les auto-encodeurs linéaires
    incomplets à 2 couches avec sparsity:
143 {2: (0.17945335097781318, 0.0867), 3: (0.
    1624708301295073, 0.1884), 4: (0.
    1670384242049006, 0.1841), 5: (0.
    17386638677411514, 0.2069), 6: (0.
    18903310568497605, 0.1907), 7: (0.
    1903491974380422, 0.2158), 8: (0.
    14016940714282478, 0.3283)}
144
145 Process finished with exit code 0
146
```