```
"C:\Users\My PC\AppData\Local\Programs\Python\Python36-32\python.exe" D:/pfe/Projets/pfe/apprentissage_LIC.py
Empty DataFrame
Columns: [classification_methode, path, validation_methode, F_mesure]
Index: []



--------Decision Tree------------


dataset/LIC/taken/LIC_del.csv


count     10990
unique        2
top       False
freq       8856
Name: is_code_smell, dtype: object
[[2651    0]
 [   0  646]]
the recall for this model is : 1.0
TP 646
TN 2651
FP 0
FN 0

----------Classification Report
                precision    recall  f1-score   support

        False       1.00      1.00      1.00      2651
         True       1.00      1.00      1.00       646

    micro avg       1.00      1.00      1.00      3297
    macro avg       1.00      1.00      1.00      3297
weighted avg       1.00      1.00      1.00      3297

Precision =  1.0
Rappel=  1.0
F_Mesure= 1.0
Decision Tree dataset/LIC/taken/LIC_del.csv Validation_70/
```

```
42 30 1.0
43
44 ----------Using cross Validation
   ----------------------------------
45
46 ----------k= 1 ----------------------------------
47
48 F_Mesure= 1.0
49
50 ----------k= 2 ----------------------------------
51
52 F_Mesure= 1.0
53
54 ----------k= 3 ----------------------------------
55
56 F_Mesure= 1.0
57
58 ----------k= 4 ----------------------------------
59
60 F_Mesure= 1.0
61
62 ----------k= 5 ----------------------------------
63
64 F_Mesure= 1.0
65 F_Mesures moyenne = 1.0
66
67
68
69 --------Decision Tree------------
70
71
72
73 dataset/LIC/taken/LIC_RandomUnderSampler.csv
74
75
76
77 count     4268
78 unique       2
79 top        True
80 freq       2134
81 Name: is_code_smell, dtype: object
82 [[649   0]
83  [  0 632]]
84 the recall for this model is : 1.0
85 TP 632
```

```
 86 TN 649
 87 FP 0
 88 FN 0
 89
 90 ----------Classification Report
    -----------------------------------
 91               precision    recall  f1-score   support
 92
 93        False       1.00      1.00      1.00       649
 94         True       1.00      1.00      1.00       632
 95
 96    micro avg       1.00      1.00      1.00      1281
 97    macro avg       1.00      1.00      1.00      1281
 98 weighted avg       1.00      1.00      1.00      1281
 99
100 Precision =  1.0
101 Rappel=  1.0
102 F_Mesure= 1.0
103 Decision Tree dataset/LIC/taken/LIC_RandomUnderSampler.
    csv Validation_70/30 1.0
104
105 ----------Using cross Validation
    -----------------------------------
106
107 ----------k= 1 ----------------------------------
108
109 F_Mesure= 1.0
110
111 ----------k= 2 ----------------------------------
112
113 F_Mesure= 1.0
114
115 ----------k= 3 ----------------------------------
116
117 F_Mesure= 1.0
118
119 ----------k= 4 ----------------------------------
120
121 F_Mesure= 1.0
122
123 ----------k= 5 ----------------------------------
124
125 F_Mesure= 1.0
126 F_Mesures moyenne = 1.0
127
```

```
128
129
130 --------Random Forest------------
131
132
133
134 dataset/LIC/taken/LIC_del.csv
135
136
137
138 count     10990
139 unique        2
140 top       False
141 freq       8856
142 Name: is_code_smell, dtype: object
143 [[2654    0]
144  [   0  643]]
145 the recall for this model is : 1.0
146 TP 643
147 TN 2654
148 FP 0
149 FN 0
150
151 ----------Classification Report
    ------------------------------------
152               precision    recall  f1-score   support
153
154        False       1.00      1.00      1.00      2654
155         True       1.00      1.00      1.00       643
156
157    micro avg       1.00      1.00      1.00      3297
158    macro avg       1.00      1.00      1.00      3297
159 weighted avg       1.00      1.00      1.00      3297
160
161 Precision =  1.0
162 Rappel=  1.0
163 F_Mesure= 1.0
164 Random Forest dataset/LIC/taken/LIC_del.csv Validation_70
    /30 1.0
165
166 ----------Using cross Validation
    ------------------------------------
167
168 ----------k= 1 ----------------------------------
169
```

```
F_Mesure= 1.0

----------k= 2 ------------------------------------

F_Mesure= 1.0

----------k= 3 ------------------------------------

F_Mesure= 1.0

----------k= 4 ------------------------------------

F_Mesure= 1.0

----------k= 5 ------------------------------------

F_Mesure= 1.0
F_Mesures moyenne = 1.0


--------Random Forest------------


dataset/LIC/taken/LIC_RandomUnderSampler.csv


count     4268
unique       2
top       True
freq      2134
Name: is_code_smell, dtype: object
[[635   0]
 [  0 646]]
the recall for this model is : 1.0
TP 646
TN 635
FP 0
FN 0

----------Classification Report
    -----------------------------------
              precision    recall  f1-score   support
```

```
214
215         False       1.00      1.00      1.00       635
216          True       1.00      1.00      1.00       646
217
218    micro avg       1.00      1.00      1.00      1281
219    macro avg       1.00      1.00      1.00      1281
220 weighted avg       1.00      1.00      1.00      1281
221
222 Precision =  1.0
223 Rappel=  1.0
224 F_Mesure= 1.0
225 Random Forest dataset/LIC/taken/LIC_RandomUnderSampler.
    csv Validation_70/30 1.0
226
227 ----------Using cross Validation
    ----------------------------------
228
229 ----------k= 1 ----------------------------------
230
231 F_Mesure= 1.0
232
233 ----------k= 2 ----------------------------------
234
235 F_Mesure= 1.0
236
237 ----------k= 3 ----------------------------------
238
239 F_Mesure= 1.0
240
241 ----------k= 4 ----------------------------------
242
243 F_Mesure= 1.0
244
245 ----------k= 5 ----------------------------------
246
247 F_Mesure= 1.0
248 F_Mesures moyenne = 1.0
249
250
251
252 --------Naive Bayes------------
253
254
255
256 dataset/LIC/taken/LIC_del.csv
```

```
257
258
259
260 count     10990
261 unique        2
262 top       False
263 freq       8856
264 Name: is_code_smell, dtype: object
265 [[2653    0]
266  [   0  644]]
267 the recall for this model is : 1.0
268 TP 644
269 TN 2653
270 FP 0
271 FN 0
272
273 ----------Classification Report
    ------------------------------------
274               precision    recall  f1-score   support
275
276        False       1.00      1.00      1.00      2653
277         True       1.00      1.00      1.00       644
278
279    micro avg       1.00      1.00      1.00      3297
280    macro avg       1.00      1.00      1.00      3297
281 weighted avg       1.00      1.00      1.00      3297
282
283 Precision =  1.0
284 Rappel=  1.0
285 F_Mesure= 1.0
286 Naive Bayes dataset/LIC/taken/LIC_del.csv Validation_70/
    30 1.0
287
288 ----------Using cross Validation
    ------------------------------------
289
290 ----------k= 1 ----------------------------------
291
292 F_Mesure= 1.0
293
294 ----------k= 2 ----------------------------------
295
296 F_Mesure= 1.0
297
298 ----------k= 3 ----------------------------------
```

```
299
300 F_Mesure= 1.0
301
302 ----------k= 4 ------------------------------------
303
304 F_Mesure= 1.0
305
306 ----------k= 5 ------------------------------------
307
308 F_Mesure= 1.0
309 F_Mesures moyenne = 1.0
310
311
312
313 --------Naive Bayes------------
314
315
316
317 dataset/LIC/taken/LIC_RandomUnderSampler.csv
318
319
320
321 count     4268
322 unique       2
323 top        True
324 freq      2134
325 Name: is_code_smell, dtype: object
326 [[627   0]
327  [  0 654]]
328 the recall for this model is : 1.0
329 TP 654
330 TN 627
331 FP 0
332 FN 0
333
334 ----------Classification Report
    ------------------------------------
335               precision    recall  f1-score   support
336
337        False       1.00      1.00      1.00       627
338         True       1.00      1.00      1.00       654
339
340    micro avg       1.00      1.00      1.00      1281
341    macro avg       1.00      1.00      1.00      1281
342 weighted avg       1.00      1.00      1.00      1281
```

```
343
344 Precision =  1.0
345 Rappel=  1.0
346 F_Mesure= 1.0
347 Naive Bayes dataset/LIC/taken/LIC_RandomUnderSampler.csv
    Validation_70/30 1.0
348
349 ----------Using cross Validation
    ------------------------------------
350
351 ----------k= 1 ------------------------------------
352
353 F_Mesure= 1.0
354
355 ----------k= 2 ------------------------------------
356
357 F_Mesure= 1.0
358
359 ----------k= 3 ------------------------------------
360
361 F_Mesure= 1.0
362
363 ----------k= 4 ------------------------------------
364
365 F_Mesure= 1.0
366
367 ----------k= 5 ------------------------------------
368
369 F_Mesure= 1.0
370 F_Mesures moyenne = 1.0
371
372
373
374 --------SVM------------
375
376
377
378 dataset/LIC/taken/LIC_del.csv
379
380
381
382 count     10990
383 unique        2
384 top       False
385 freq       8856
```

```
386 Name: is_code_smell, dtype: object
387 [[2654    0]
388  [   0  643]]
389 the recall for this model is : 1.0
390 TP 643
391 TN 2654
392 FP 0
393 FN 0
394
395 ----------Classification Report
    ------------------------------------
396               precision    recall  f1-score   support
397
398        False       1.00      1.00      1.00      2654
399         True       1.00      1.00      1.00       643
400
401    micro avg       1.00      1.00      1.00      3297
402    macro avg       1.00      1.00      1.00      3297
403 weighted avg       1.00      1.00      1.00      3297
404
405 Precision =  1.0
406 Rappel=  1.0
407 F_Mesure= 1.0
408 Naive Bayes dataset/LIC/taken/LIC_del.csv Validation_70/
    30 1.0
409
410 ----------Using cross Validation
    ----------------------------------
411
412 ----------k= 1 ----------------------------------
413
414 F_Mesure= 1.0
415
416 ----------k= 2 ----------------------------------
417
418 F_Mesure= 1.0
419
420 ----------k= 3 ----------------------------------
421
422 F_Mesure= 1.0
423
424 ----------k= 4 ----------------------------------
425
426 F_Mesure= 1.0
427
```

```
----------k= 5 ------------------------------------

F_Mesure= 1.0
F_Mesures moyenne = 1.0



--------SVM------------



dataset/LIC/taken/LIC_RandomUnderSampler.csv



count     4268
unique       2
top       True
freq      2134
Name: is_code_smell, dtype: object
[[630   0]
 [  0 651]]
the recall for this model is : 1.0
TP 651
TN 630
FP 0
FN 0

----------Classification Report
    ------------------------------------
                precision    recall  f1-score   support

        False       1.00      1.00      1.00       630
         True       1.00      1.00      1.00       651

    micro avg       1.00      1.00      1.00      1281
    macro avg       1.00      1.00      1.00      1281
weighted avg       1.00      1.00      1.00      1281

Precision =  1.0
Rappel=  1.0
F_Mesure= 1.0
Naive Bayes dataset/LIC/taken/LIC_RandomUnderSampler.csv
    Validation_70/30 1.0

```

```
----------Using cross Validation
    ------------------------------------

----------k= 1 ----------------------------------

F_Mesure= 1.0

----------k= 2 ----------------------------------

F_Mesure= 1.0

----------k= 3 ----------------------------------

F_Mesure= 1.0

----------k= 4 ----------------------------------

F_Mesure= 1.0

----------k= 5 ----------------------------------

F_Mesure= 1.0
F_Mesures moyenne = 1.0

Process finished with exit code 0

```