TABLE DES MATIERES

KNN (150 WORDS BY CODE)

TRAIN_R2_SCORE = 0.8638242265848174

TEST_R2_SCORE = 0.8516379991490913

BEST_PARAMS: [{'N_NEIGHBORS': 10}]

estimator KNeighborsClassifier()

params {'n_neighbors': [10]}

df.shape : (82265, 4052)

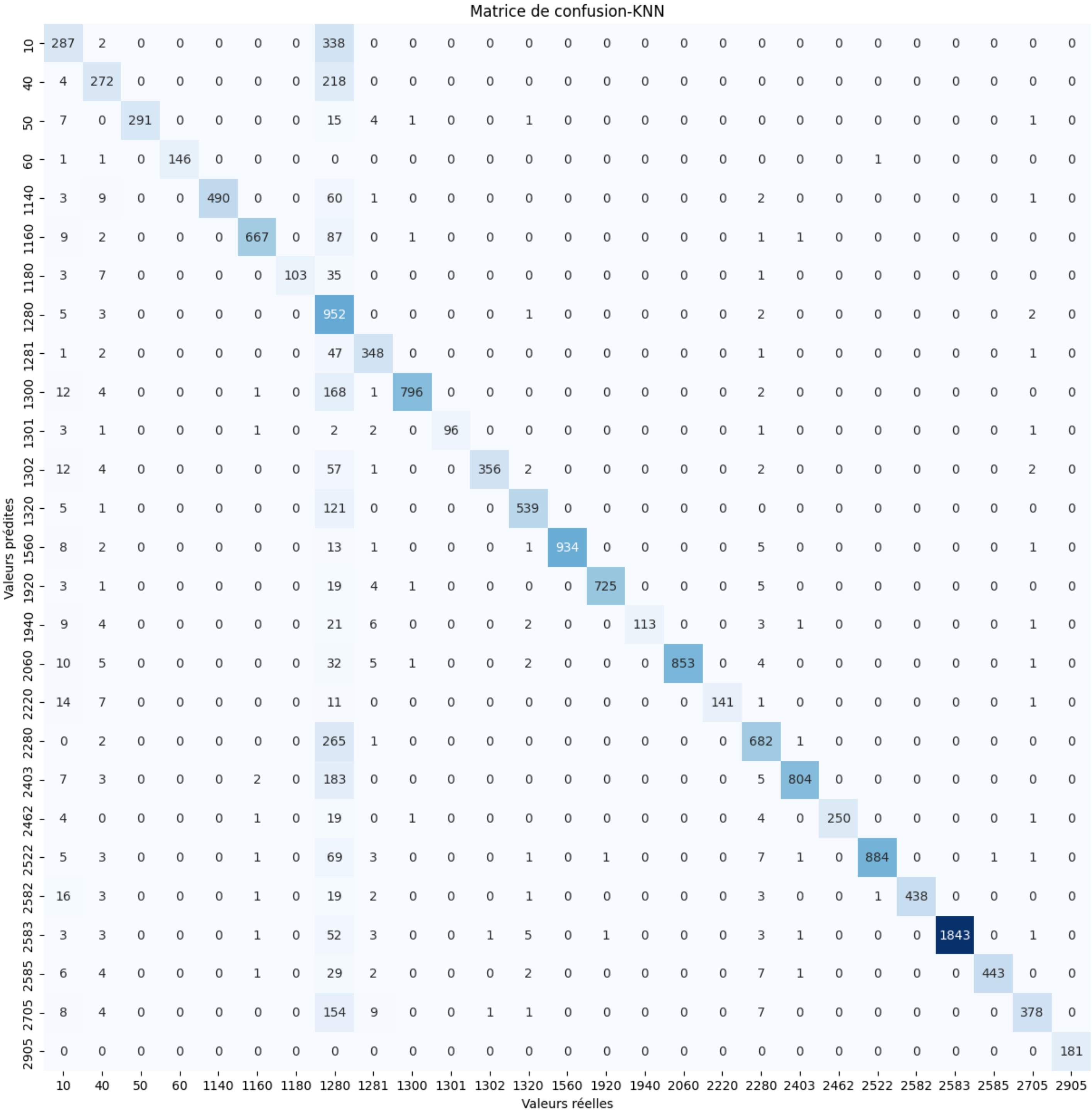
X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 4050) - (16453, 4050) - 65812 - 16453

============================CONFUSION MATRIX=======================================

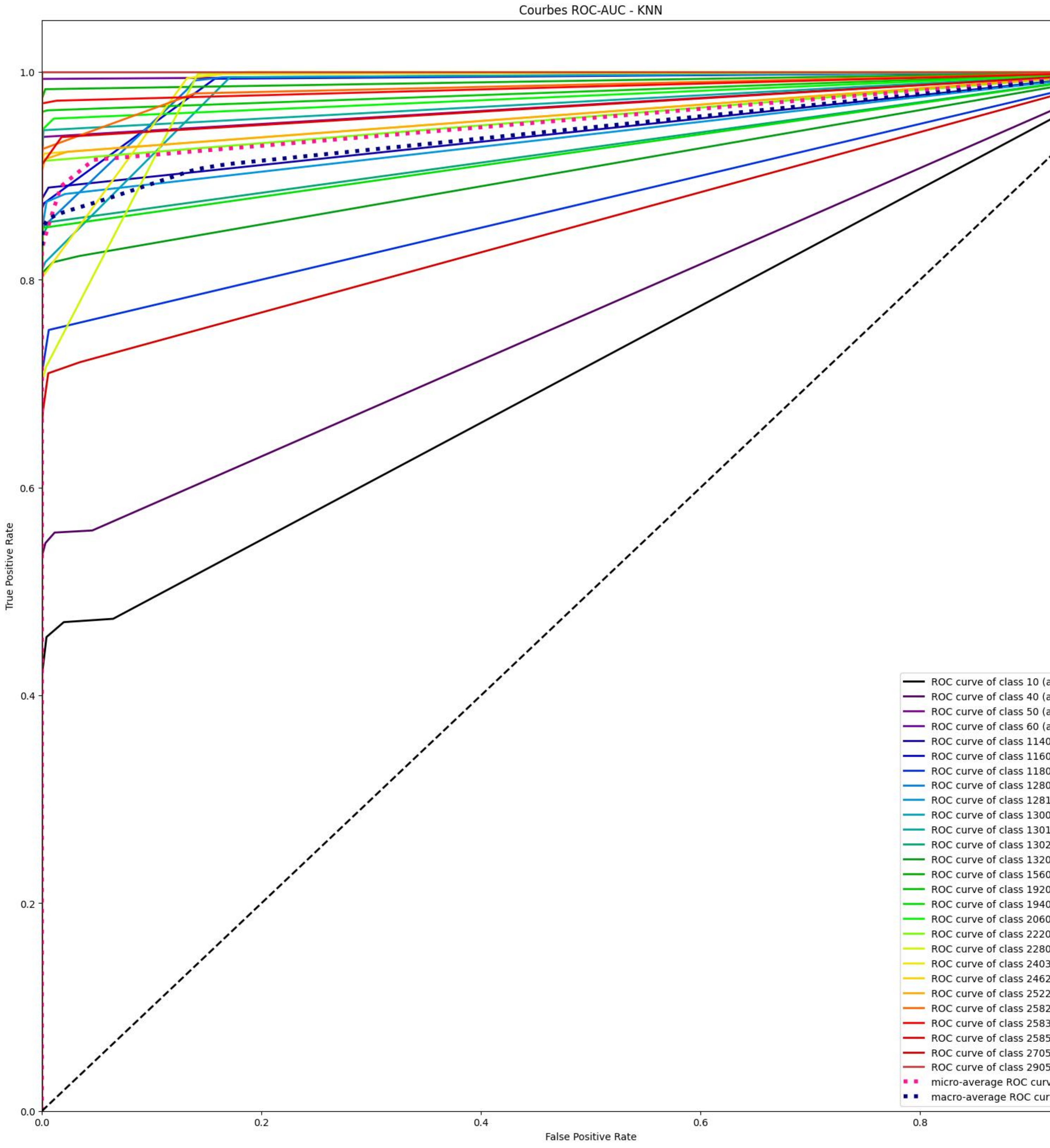
3. Use SEABORN to draw confusion_matrix--

Confusion matrix as graph with Seaborn :



	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	287	2	0	0	0	0	0	338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	4	272	0	0	0	0	0	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	7	0	291	0	0	0	0	15	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
60	1	1	0	146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1140	3	9	0	0	490	0	0	60	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0
1160	9	2	0	0	0	667	0	87	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
1180	3	7	0	0	0	0	103	35	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1280	5	3	0	0	0	0	0	952	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	2	0
1281	1	2	0	0	0	0	0	47	348	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
1300	12	4	0	0	0	1	0	168	1	796	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
1301	3	1	0	0	0	1	0	2	2	0	96	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
1302	12	4	0	0	0	0	0	57	1	0	0	356	2	0	0	0	0	0	2	0	0	0	0	0	0	2	0
1320	5	1	0	0	0	0	0	121	0	0	0	0	539	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	8	2	0	0	0	0	0	13	1	0	0	0	1	934	0	0	0	0	5	0	0	0	0	0	0	1	0
1920	3	1	0	0	0	0	0	19	4	1	0	0	0	0	725	0	0	0	5	0	0	0	0	0	0	0	0
1940	9	4	0	0	0	0	0	21	6	0	0	0	2	0	0	113	0	0	3	1	0	0	0	0	0	1	0
2060	10	5	0	0	0	0	0	32	5	1	0	0	2	0	0	0	853	0	4	0	0	0	0	0	0	1	0
2220	14	7	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	141	1	0	0	0	0	0	0	1	0
2280	0	2	0	0	0	0	0	265	1	0	0	0	0	0	0	0	0	0	682	1	0	0	0	0	0	0	0
2403	7	3	0	0	0	2	0	183	0	0	0	0	0	0	0	0	0	0	5	804	0	0	0	0	0	0	0
2462	4	0	0	0	0	1	0	19	0	1	0	0	0	0	0	0	0	0	4	0	250	0	0	0	0	1	0
2522	5	3	0	0	0	1	0	69	3	0	0	0	1	0	1	0	0	0	7	1	0	884	0	0	1	1	0
2582	16	3	0	0	0	1	0	19	2	0	0	0	1	0	0	0	0	0	3	0	0	1	438	0	0	0	0
2583	3	3	0	0	0	1	0	52	3	0	0	1	5	0	1	0	0	0	3	1	0	0	0	1843	0	1	0
2585	6	4	0	0	0	1	0	29	2	0	0	0	2	0	0	0	0	0	7	1	0	0	0	0	443	0	0
2705	8	4	0	0	0	0	0	154	9	0	0	1	1	0	0	0	0	0	7	0	0	0	0	0	0	378	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181

```
train_f1_score = [array([0.57901204, 0.68607825, 0.95127796, 0.98703404, 0.93035079,
    0.93022476, 0.87568556, 0.48681333, 0.88793103, 0.90987821,
    0.93099671, 0.92581944, 0.88107058, 0.98251479, 0.98434668,
    0.89974293, 0.97252903, 0.94146744, 0.816935  , 0.87853233,
    0.95158287, 0.95363889, 0.95509992, 0.98576165, 0.95005429,
    0.82464956, 0.99855072])]
test_f1_score = [array([0.53544776, 0.64531435, 0.95253682, 0.98983051, 0.9280303 ,
    0.92382271, 0.81746032, 0.48190332, 0.8776797 , 0.89187675,
    0.94581281, 0.89672544, 0.88071895, 0.98367562, 0.97643098,
    0.82783883, 0.96602492, 0.89240506, 0.80282519, 0.88643881,
    0.94339623, 0.94900698, 0.95010846, 0.98031915, 0.94355698,
    0.79162304, 1.        ])]
train_mse_result =  160215.49750805323
test_mse_result = 184986.59539293745
```



KNN (150 WORDS BY CODE)

ESTIMATOR KNEIGHBORSCLASSIFIER()

PARAMS {'N_NEIGHBORS': [10]}

TRAIN_R2_SCORE = 0.8857199294961405

TEST_R2_SCORE = 0.8786847383455905

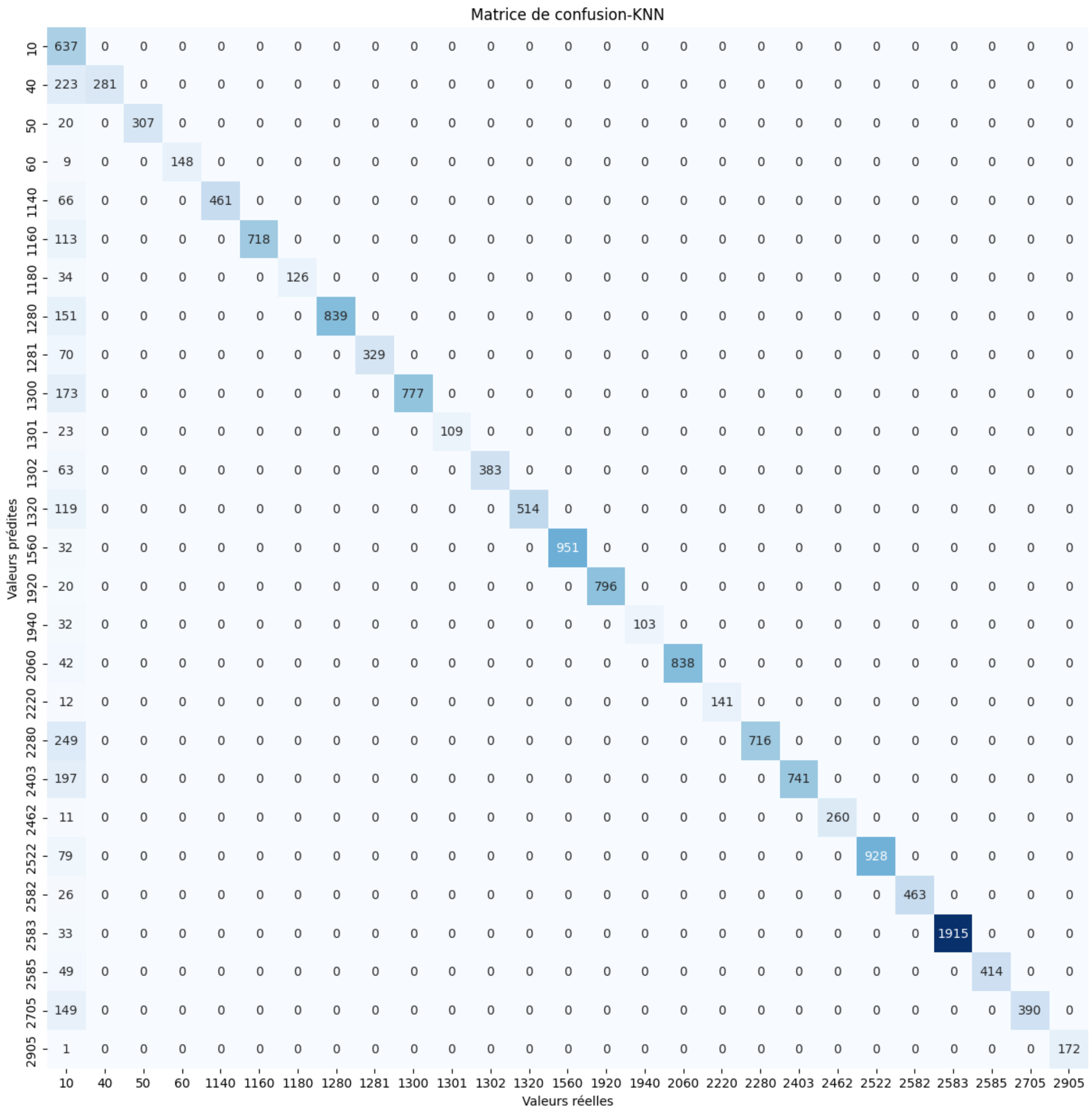
X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 4050) - (16453, 4050) - 65812 - 16453

Fitting 3 folds for each of 1 candidates, totalling 3 fits

============================CONFUSION MATRIX=======================================

3. Use SEABORN to draw confusion_matrix--



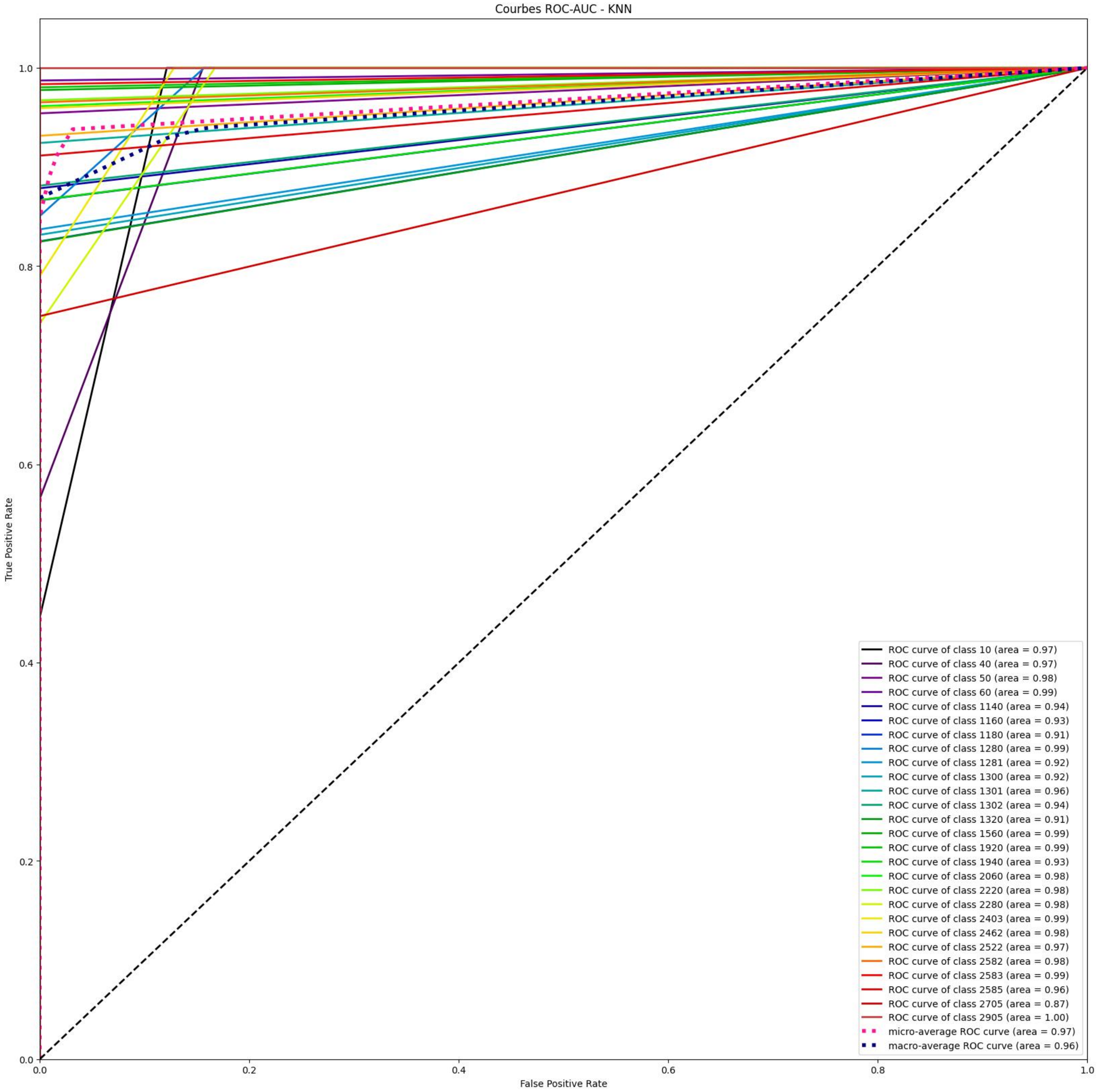
Matrice de confusion-KNN

Valeurs prédites

Valeurs réelles

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	223	281	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	20	0	307	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	9	0	0	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	66	0	0	0	461	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	113	0	0	0	0	718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	34	0	0	0	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	151	0	0	0	0	0	0	839	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	70	0	0	0	0	0	0	0	329	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	173	0	0	0	0	0	0	0	0	777	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	23	0	0	0	0	0	0	0	0	0	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	63	0	0	0	0	0	0	0	0	0	0	383	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	119	0	0	0	0	0	0	0	0	0	0	0	514	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	32	0	0	0	0	0	0	0	0	0	0	0	0	951	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	20	0	0	0	0	0	0	0	0	0	0	0	0	0	796	0	0	0	0	0	0	0	0	0	0	0	0
1940	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	0	0	0	0	0	0	0	0
2060	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	838	0	0	0	0	0	0	0	0	0	0
2220	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	0	0	0	0	0	0	0	0	0
2280	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	716	0	0	0	0	0	0	0	0
2403	197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	741	0	0	0	0	0	0	0
2462	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	260	0	0	0	0	0	0
2522	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	928	0	0	0	0	0
2582	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	463	0	0	0	0
2583	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1915	0	0	0
2585	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	414	0	0
2705	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390	0
2905	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	172

```
train_f1_score = [array([0.39711423, 0.72972973, 0.96431404, 0.99018003, 0.94329389,

    0.93843537, 0.87940631, 0.9235361 , 0.92734032, 0.91129685,

    0.94292237, 0.92778741, 0.89739729, 0.99012947, 0.98742666,

    0.92679002, 0.9777964 , 0.95019763, 0.83607313, 0.89386929,

    0.97977528, 0.96024384, 0.97210136, 0.98762054, 0.96360759,

    0.83718487, 0.99928418])]

test_f1_score = [array([0.38960245, 0.71592357, 0.96845426, 0.9704918 , 0.93319838,

    0.92704971, 0.88111888, 0.91744122, 0.90384615, 0.89982629,

    0.90456432, 0.92400483, 0.89625109, 0.98345398, 0.98759305,

    0.86554622, 0.97555297, 0.95918367, 0.85187388, 0.88266825,
    0.97928437, 0.95917313, 0.97268908, 0.99145742, 0.94412771,

    0.83961249, 0.99710145])]

train_mse_result =  389357.61490305717

test_mse_result = 398629.87017565186

best_params: [{'n_neighbors': 10}]
```



KNN (150 WORDS CODE) AVEC SCALING

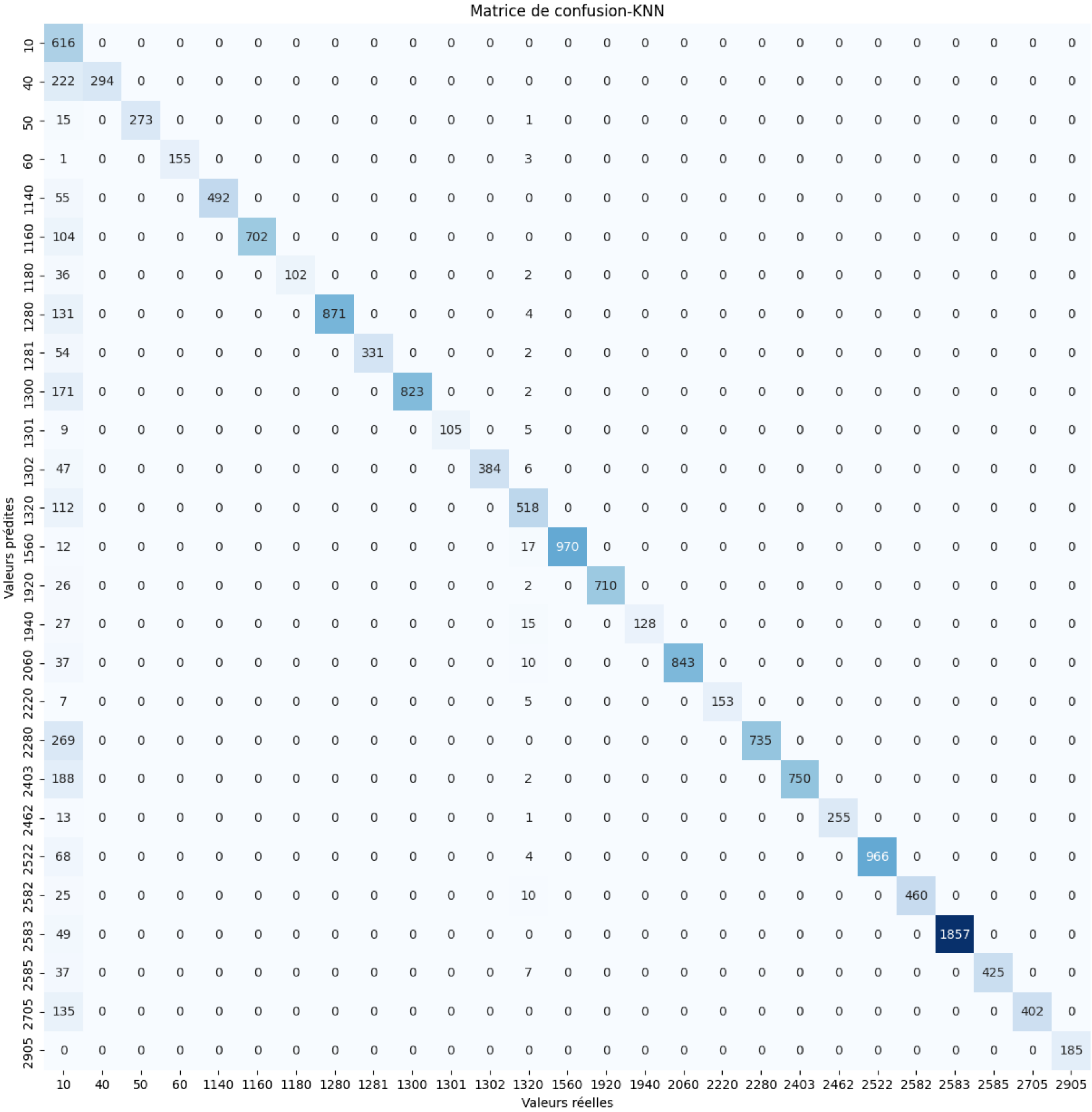
ESTIMATOR KNEIGHBORSCLASSIFIER()

PARAMS {'N_NEIGHBORS': [10, 12, 30]}

TRAIN_R2_SCORE = 0.8887436941591199

TEST_R2_SCORE = 0.88160213942746

```
-----------------------------------------------------------------------

df.shape : (82265, 4052)

Fitting 3 folds for each of 3 candidates, totalling 9 fits

X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 4050) - (16453, 4050) - 65812 - 16453



=============================CONFUSION MATRIX========================================

Use SEABORN to draw confusion_matrix-----------------------------------------------

Confusion matrix as graph with Seaborn :
```



Matrice de confusion-KNN

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	222	294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	15	0	273	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	1	0	0	155	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	55	0	0	0	492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	104	0	0	0	0	702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	36	0	0	0	0	0	102	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	131	0	0	0	0	0	0	871	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	54	0	0	0	0	0	0	0	331	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	171	0	0	0	0	0	0	0	0	823	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	9	0	0	0	0	0	0	0	0	0	105	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	47	0	0	0	0	0	0	0	0	0	0	384	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	112	0	0	0	0	0	0	0	0	0	0	0	518	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	12	0	0	0	0	0	0	0	0	0	0	0	17	970	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	26	0	0	0	0	0	0	0	0	0	0	0	2	0	710	0	0	0	0	0	0	0	0	0	0	0	0
1940	27	0	0	0	0	0	0	0	0	0	0	0	15	0	0	128	0	0	0	0	0	0	0	0	0	0	0
2060	37	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	843	0	0	0	0	0	0	0	0	0	0
2220	7	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	153	0	0	0	0	0	0	0	0	0
2280	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	735	0	0	0	0	0	0	0	0
2403	188	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	750	0	0	0	0	0	0	0
2462	13	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	255	0	0	0	0	0	0
2522	68	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	966	0	0	0	0	0
2582	25	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	460	0	0	0	0
2583	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1857	0	0	0
2585	37	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	425	0	0
2705	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	402	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185

```
train_f1_score = [array([0.41769083, 0.73500967, 0.9689298 , 0.99673736, 0.9419387 ,

    0.93805907, 0.90718039, 0.92072124, 0.92792491, 0.91580663,

    0.95499451, 0.93367639, 0.83938852, 0.98852649, 0.9897277 ,

    0.92972058, 0.97787735, 0.9542903 , 0.83787973, 0.89236564,

    0.98163905, 0.95949739, 0.97016461, 0.98893276, 0.96046697,

    0.85121825, 0.99854227])]

test_f1_score = [array([0.39974043, 0.72592593, 0.97153025, 0.98726115, 0.94706449,

    0.93103448, 0.84297521, 0.92807672, 0.92200557, 0.9048928 ,

    0.9375    , 0.93544458, 0.83146067, 0.98527171, 0.98066298,

    0.8590604 , 0.9728794 , 0.96226415, 0.8453134 , 0.88757396,
    0.97328244, 0.96407186, 0.96335079, 0.98697847, 0.950783  ,
    0.85623003, 1.        ])]
train_mse_result =  361571.8485230657
test_mse_result = 382027.62973317935
```

best_params: [{'n_neighbors': 10}]

KNN (100 WORDS BY CODE)

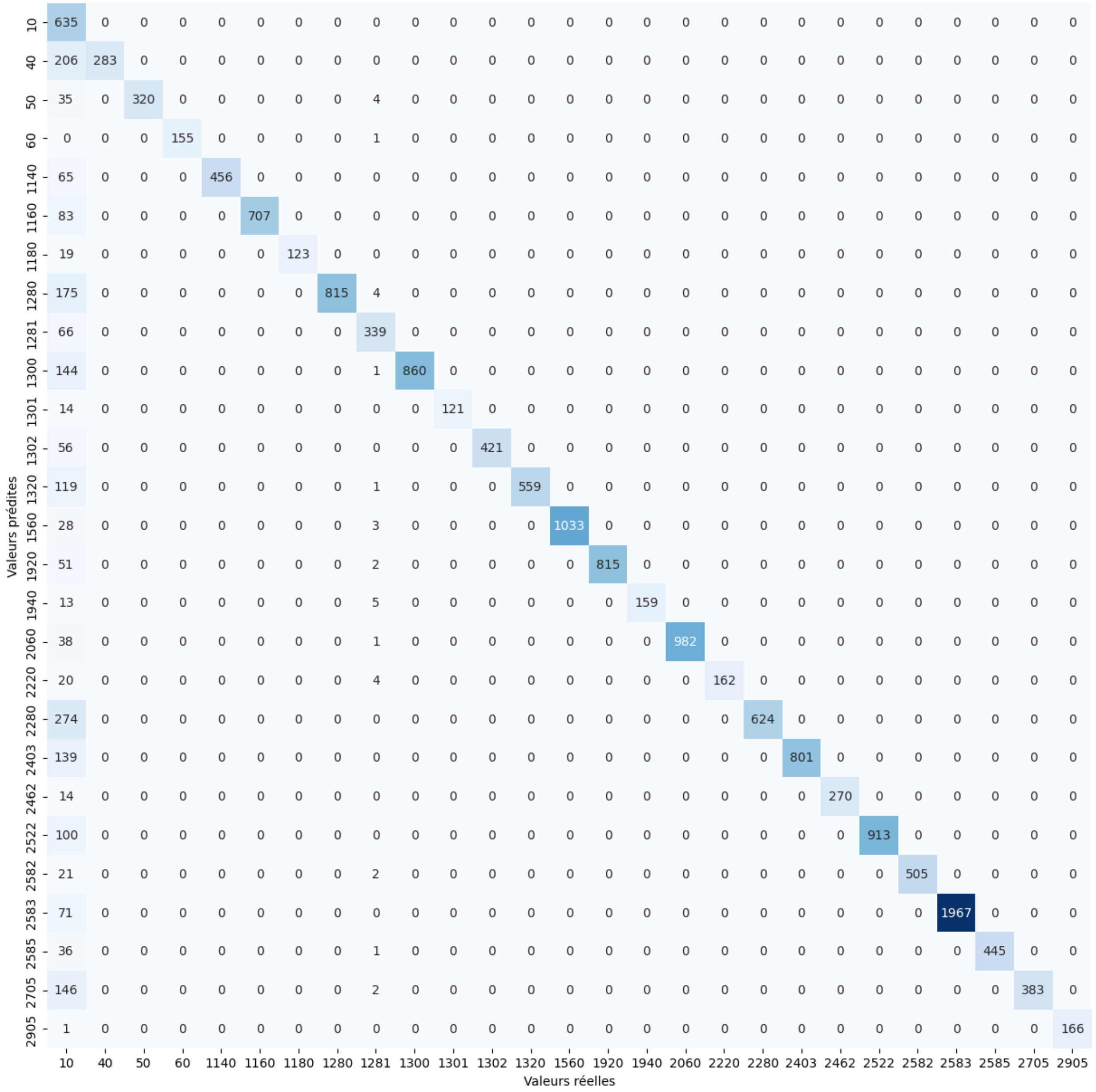
TRAIN_R2_SCORE = 0.8861802979450039

TEST_R2_SCORE = 0.8843028732925106

BEST_PARAMS: [{'ALGORITHM': 'AUTO', 'N_JOBS': -1, 'N_NEIGHBORS': 10, 'WEIGHTS': 'DISTANCE'}]

```
X_train.shape - X_test.shape - len(y_train) - len(y_test)

(67932, 2700) - (16984, 2700) - 67932 - 16984

estimator                       KNeighborsClassifier()

params    {'n_neighbors': [10], 'weights': ['uniform', '...

----------------------------------------------------------------------

Fitting 3 folds for each of 2 candidates, totalling 6 fits

train_f1_score = [array([0.39089334, 0.76324655, 0.95494071, 0.99925981, 0.92794814,

     0.93105779, 0.8762421 , 0.90616622, 0.91707317, 0.91470786,

     0.95813953, 0.94      , 0.90372272, 0.98390572, 0.98402839,

     0.95230126, 0.97602475, 0.97179694, 0.81697044, 0.91878173,

     0.97751799, 0.95299539, 0.98472906, 0.98477977, 0.959442  ,

     0.85405961, 1.        ])]

test_f1_score = [array([0.39637953, 0.73316062, 0.94256259, 0.99678457, 0.93346981,

     0.94455578, 0.92830189, 0.9010503 , 0.87483871, 0.92225201,

     0.9453125 , 0.9376392 , 0.90306947, 0.98521698, 0.96850862,

     0.94642857, 0.98052921, 0.93103448, 0.81997372, 0.92016083,

     0.97472924, 0.94807892, 0.97773475, 0.98227216, 0.9600863 ,

     0.8380744 , 0.996997  ])]

train_mse_result =  382045.8192162751

test_mse_result = 388084.74004945834

============================CONFUSION MATRIX=======================================

Use SEABORN to draw confusion_matrix----------------------------------------------

Confusion matrix as graph with Seaborn :
```

Matrice de confusion-KNN



	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	635	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	206	283	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	35	0	320	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	155	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	65	0	0	0	456	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	83	0	0	0	0	707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	19	0	0	0	0	0	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	175	0	0	0	0	0	0	815	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	66	0	0	0	0	0	0	0	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	144	0	0	0	0	0	0	0	1	860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	14	0	0	0	0	0	0	0	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	56	0	0	0	0	0	0	0	0	0	0	421	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	119	0	0	0	0	0	0	0	1	0	0	0	559	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	28	0	0	0	0	0	0	0	3	0	0	0	0	1033	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	51	0	0	0	0	0	0	0	2	0	0	0	0	0	815	0	0	0	0	0	0	0	0	0	0	0	0
1940	13	0	0	0	0	0	0	0	5	0	0	0	0	0	0	159	0	0	0	0	0	0	0	0	0	0	0
2060	38	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	982	0	0	0	0	0	0	0	0	0	0
2220	20	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	162	0	0	0	0	0	0	0	0	0
2280	274	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	624	0	0	0	0	0	0	0	0
2403	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	801	0	0	0	0	0	0	0
2462	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	0	0	0	0	0	0
2522	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	913	0	0	0	0	0
2582	21	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	505	0	0	0	0
2583	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1967	0	0	0
2585	36	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	445	0	0
2705	146	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	383	0
2905	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	166

KNN (100 WORDS BY CODE) APRES UNE PCA (REDUCTION DE 80% DES VARIABLES) – 2MIN

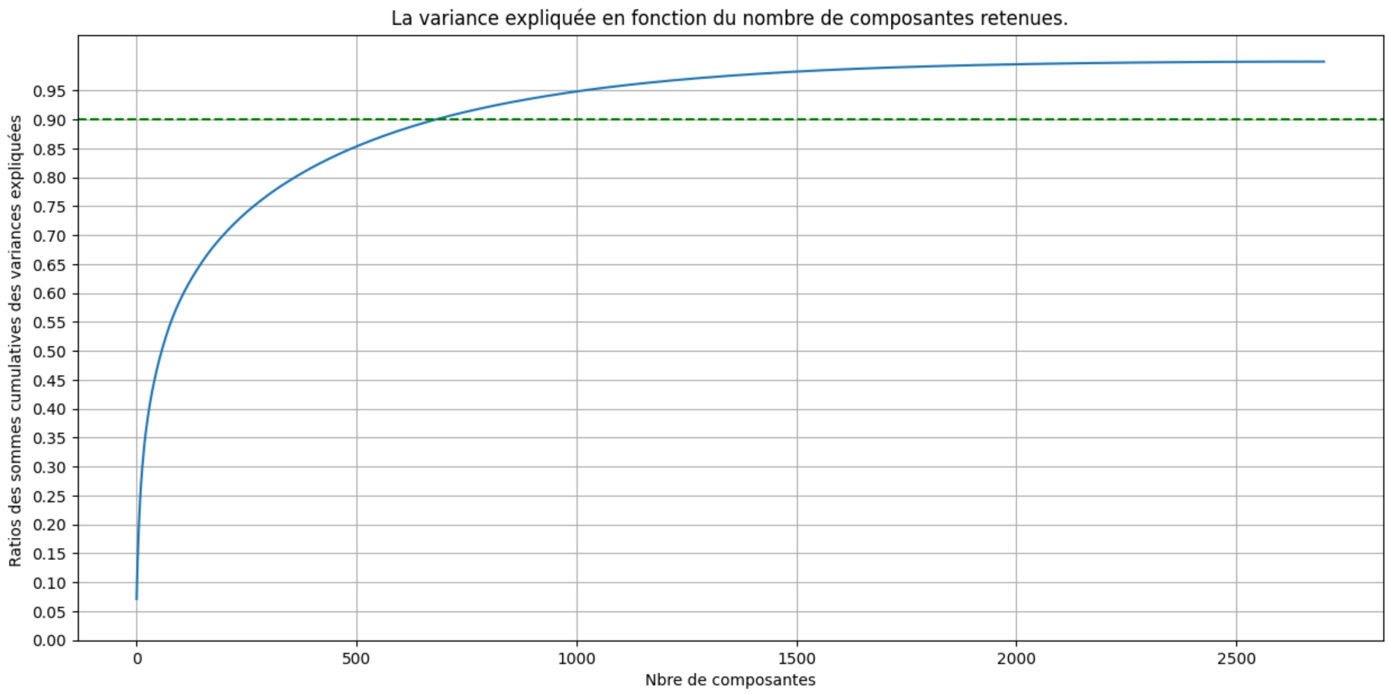
TRAIN_R2_SCORE = 0.8463046252962986

TEST_R2_SCORE = 0.8340120342794627

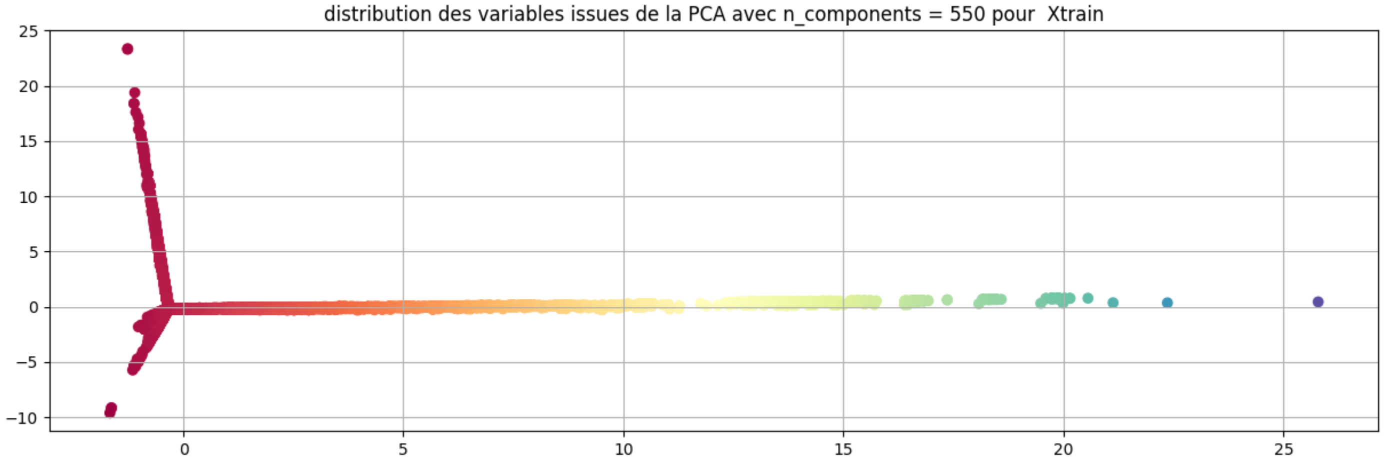
TRAIN_MSE_RESULT = 409521.15333069954

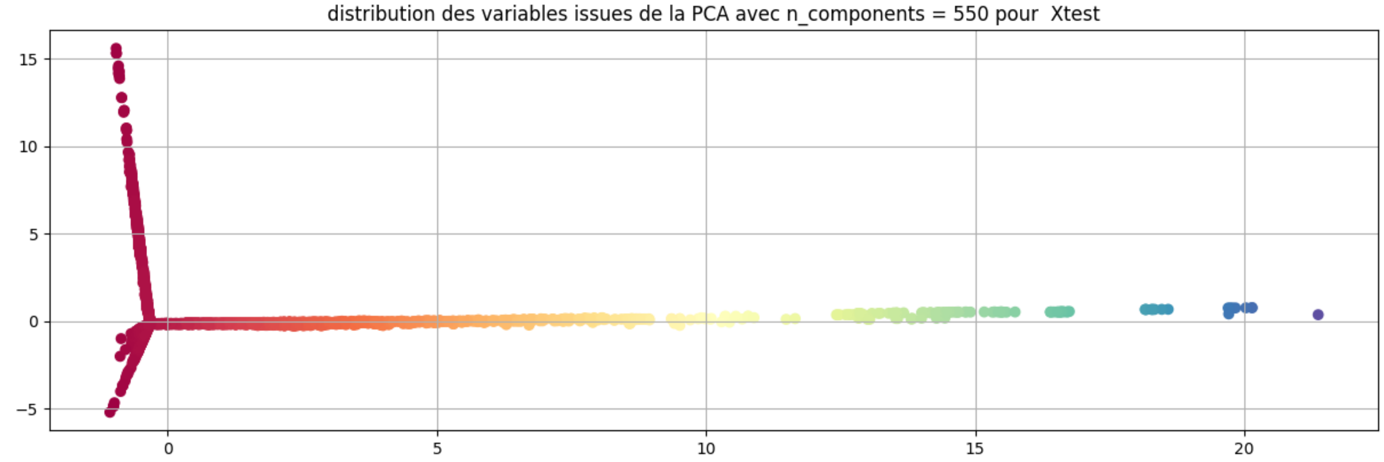
TEST_MSE_RESULT = 195946.71190664318

BEST_PARAMS: [{'N_NEIGHBORS': 10}]



Un minimum de **550** pour le # de composantes après réduction de dimensions PCA donnant un pourcentage de réduction de : **80.0 %**



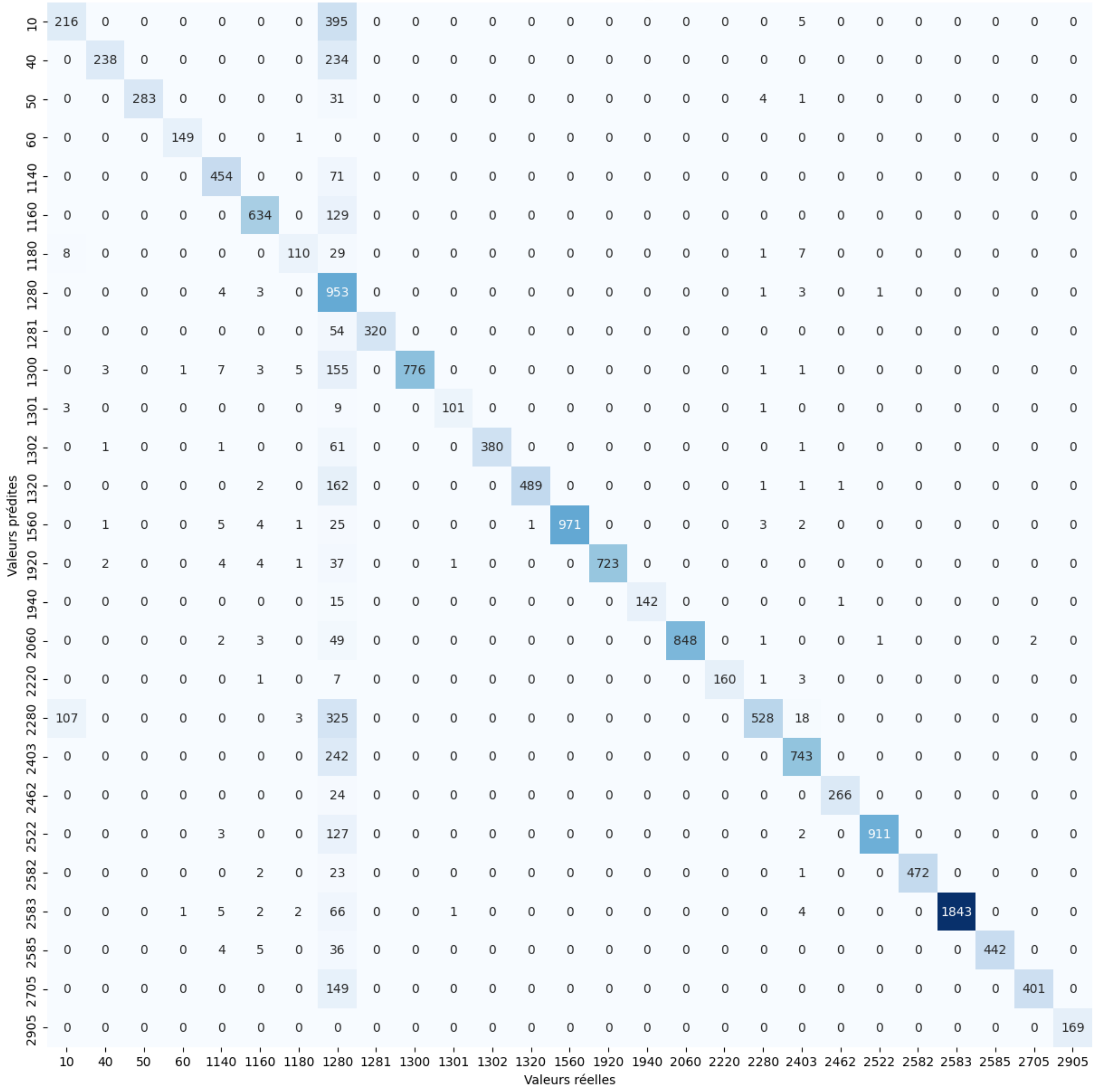


df.shape : (82265, 2702)

X_train.shape - X_test.shape - len(y_train) - len(y_test)
(65812, 550) - (16453, 550) - 65812 – 16453

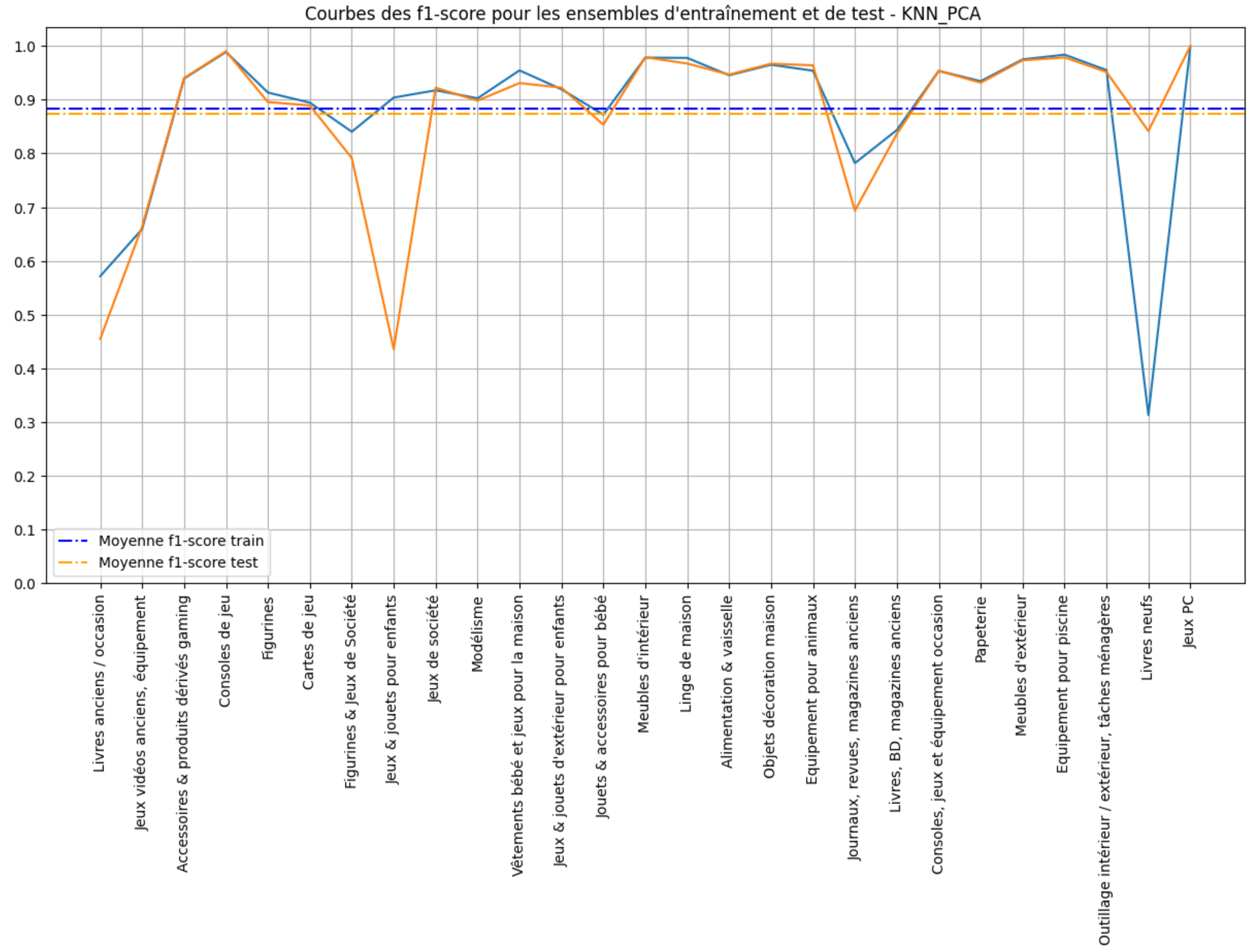
```
{'mean_fit_time': array([0.18550777]),
 'std_fit_time': array([0.00195567]),
 'mean_score_time': array([30.12307461]),
 'std_score_time': array([0.06649759]),
 'param_n_neighbors': masked_array(data=[10],
             mask=[False],
       fill_value='?',
            dtype=object),
 'params': [{'n_neighbors': 10}],
 'split0_test_score': array([0.84086972]),
 'split1_test_score': array([0.84159183]),
 'split2_test_score': array([0.83753476]),
 'mean_test_score': array([0.83999877]),
 'std_test_score': array([0.00176708]),
 'rank_test_score': array([1])}
```

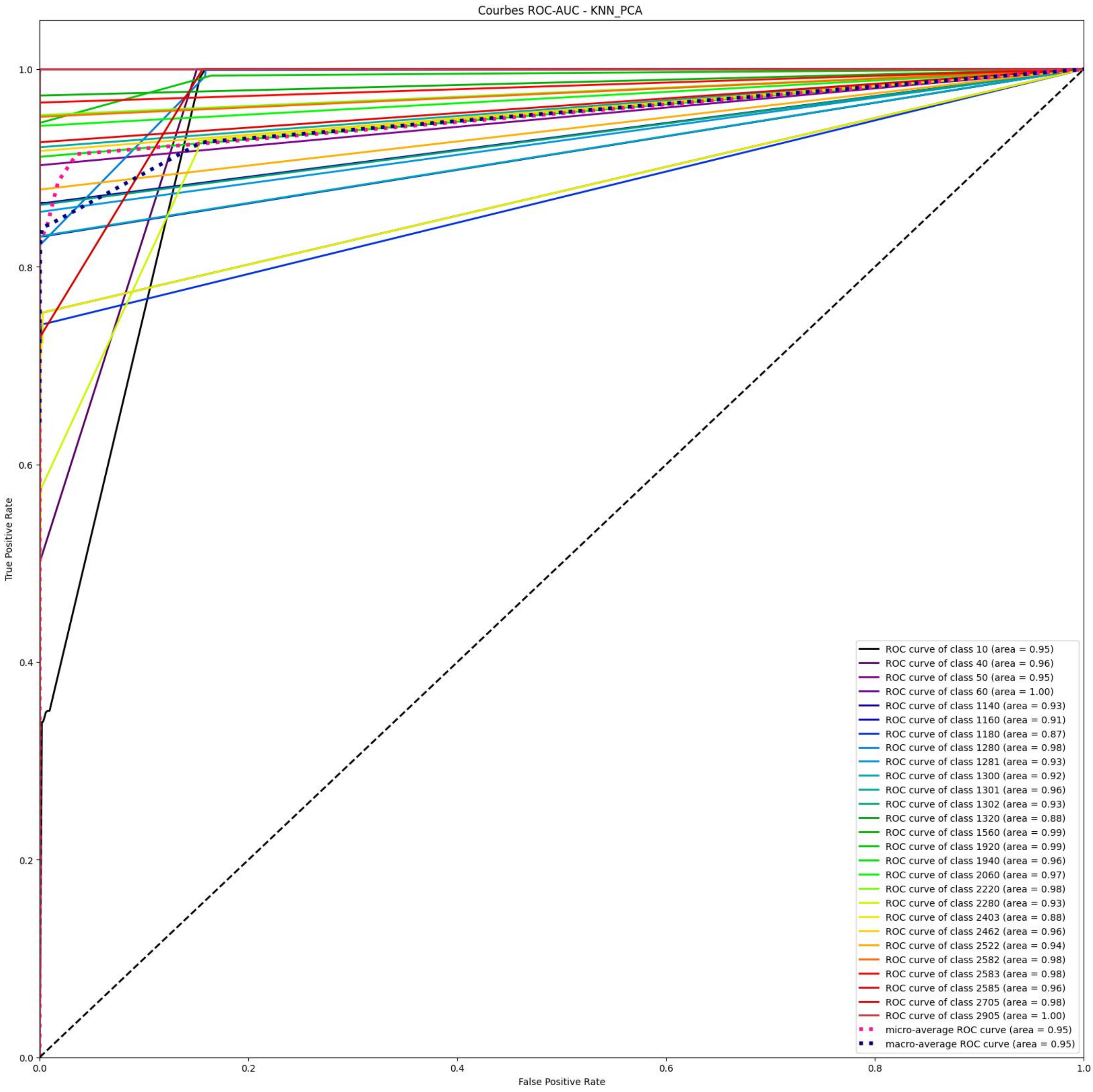
Matrice de confusion-KNN_PCA



Valeurs prédites / Valeurs réelles

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	216	0	0	0	0	0	0	395	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
40	0	238	0	0	0	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	283	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0
60	0	0	0	149	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	0	0	0	0	454	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	0	0	0	0	0	634	0	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	8	0	0	0	0	0	110	29	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0
1280	0	0	0	0	4	3	0	953	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	0	0	0	0
1281	0	0	0	0	0	0	0	54	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	3	0	1	7	3	5	155	0	776	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
1301	3	0	0	0	0	0	0	9	0	0	101	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1302	0	1	0	0	1	0	0	61	0	0	0	380	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1320	0	0	0	0	0	2	0	162	0	0	0	0	489	0	0	0	0	0	1	1	1	0	0	0	0	0	0
1560	0	1	0	0	5	4	1	25	0	0	0	0	1	971	0	0	0	0	3	2	0	0	0	0	0	0	0
1920	0	2	0	0	4	4	1	37	0	0	1	0	0	0	723	0	0	0	0	0	0	0	0	0	0	0	0
1940	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	142	0	0	0	0	1	0	0	0	0	0	0
2060	0	0	0	0	2	3	0	49	0	0	0	0	0	0	0	0	848	0	1	0	0	1	0	0	0	2	0
2220	0	0	0	0	0	1	0	7	0	0	0	0	0	0	0	0	0	160	1	3	0	0	0	0	0	0	0
2280	107	0	0	0	0	0	3	325	0	0	0	0	0	0	0	0	0	0	528	18	0	0	0	0	0	0	0
2403	0	0	0	0	0	0	0	242	0	0	0	0	0	0	0	0	0	0	0	743	0	0	0	0	0	0	0
2462	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	266	0	0	0	0	0	0
2522	0	0	0	0	3	0	0	127	0	0	0	0	0	0	0	0	0	0	0	2	0	911	0	0	0	0	0
2582	0	0	0	0	0	2	0	23	0	0	0	0	0	0	0	0	0	0	0	1	0	0	472	0	0	0	0
2583	0	0	0	1	5	2	2	66	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	1843	0	0	0
2585	0	0	0	0	4	5	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	442	0	0
2705	0	0	0	0	0	0	0	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	401	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes des f1-score pour les ensembles d'entraînement et de test - KNN_PCA
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Moyenne f1-score train
Moyenne f1-score test
Livres anciens / occasion
Jeux vidéos anciens, équipement
Accessoires & produits dérivés gaming
Consoles de jeu
Figurines
Cartes de jeu
Figurines & Jeux de Société
Jeux & jouets pour enfants
Jeux de société
Modélisme
Vêtements bébé et jeux pour la maison
Jeux & jouets d'extérieur pour enfants
Jouets & accessoires pour bébé
Meubles d'intérieur
Linge de maison
Alimentation & vaisselle
Objets décoration maison
Equipement pour animaux
Journaux, revues, magazines anciens
Livres, BD, magazines anciens
Consoles, jeux et équipement occasion
Papeterie
Meubles d'extérieur
Equipement pour piscine
Outillage intérieur / extérieur, tâches ménagères
Livres neufs
Jeux PC


Courbes ROC-AUC - KNN_PCA
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ROC curve of class 10 (area = 0.95)
ROC curve of class 40 (area = 0.96)
ROC curve of class 50 (area = 0.95)
ROC curve of class 60 (area = 1.00)
ROC curve of class 1140 (area = 0.93)
ROC curve of class 1160 (area = 0.91)
ROC curve of class 1180 (area = 0.87)
ROC curve of class 1280 (area = 0.98)
ROC curve of class 1281 (area = 0.93)
ROC curve of class 1300 (area = 0.92)
ROC curve of class 1301 (area = 0.96)
ROC curve of class 1302 (area = 0.93)
ROC curve of class 1320 (area = 0.88)
ROC curve of class 1560 (area = 0.99)
ROC curve of class 1920 (area = 0.99)
ROC curve of class 1940 (area = 0.96)
ROC curve of class 2060 (area = 0.97)
ROC curve of class 2220 (area = 0.98)
ROC curve of class 2280 (area = 0.93)
ROC curve of class 2403 (area = 0.88)
ROC curve of class 2462 (area = 0.96)
ROC curve of class 2522 (area = 0.94)
ROC curve of class 2582 (area = 0.98)
ROC curve of class 2583 (area = 0.98)
ROC curve of class 2585 (area = 0.96)
ROC curve of class 2705 (area = 0.98)
ROC curve of class 2905 (area = 1.00)
micro-average ROC curve (area = 0.95)
macro-average ROC curve (area = 0.95)

RFC - RANDOMFORESTCLASSIFIER (300 WORDS BY CODE) – THE BEST

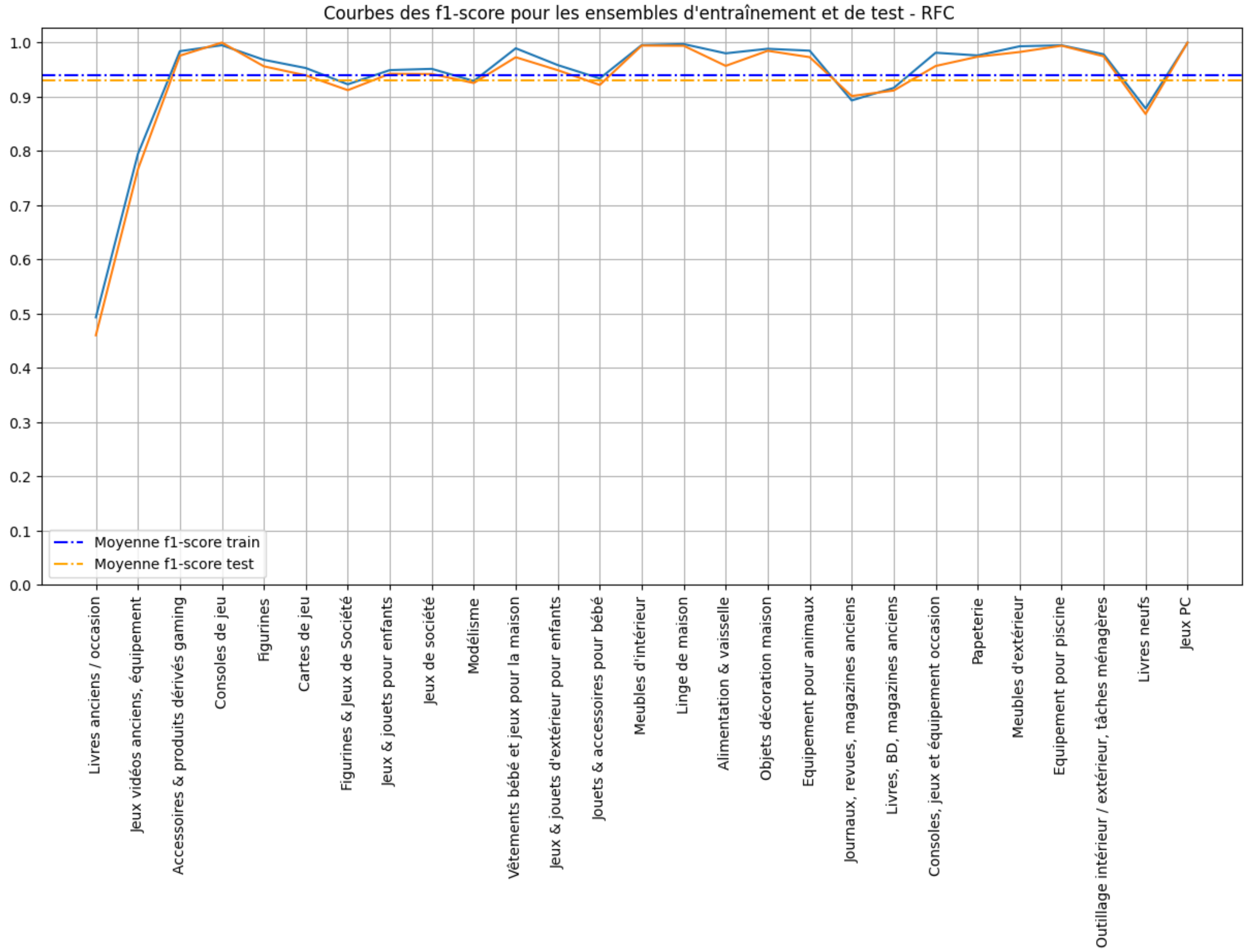
TRAIN_R2_SCORE = 0.9220203002491947

TEST_R2_SCORE = 0.9121740715978849

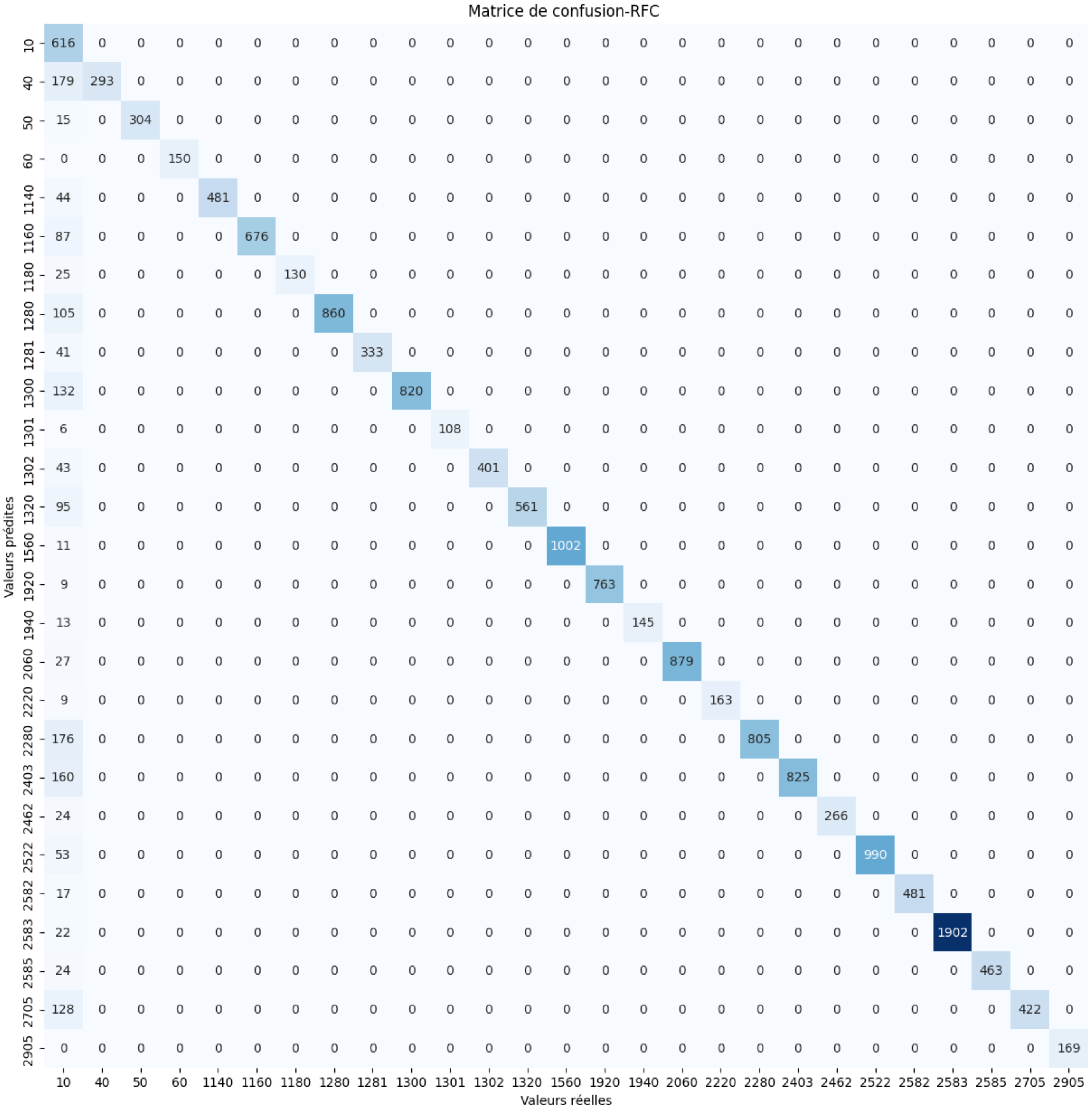
BEST_PARAMS: [{'MAX_FEATURES': 'SQRT', 'MIN_SAMPLES_SPLIT': 10}]

```
X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 8100) - (16453, 8100) - 65812 - 16453

estimator                RandomForestClassifier()

params    {'max_features': ['sqrt'], 'min_samples_split'...

Fitting 3 folds for each of 1 candidates, totalling 3 fits

train_f1_score = [array([0.49328594, 0.79447115, 0.98415153, 0.99516908, 0.96825397,
       0.95305318, 0.92307692, 0.94928335, 0.95154472, 0.92915893,
       0.9894958 , 0.95852018, 0.93389297, 0.99550302, 0.99721813,
       0.98020586, 0.98858892, 0.98505114, 0.89335485, 0.9163918 ,
       0.98128708, 0.97629708, 0.99320071, 0.99503514, 0.97842105,
       0.87859506, 1.        ])]

test_f1_score = [array([0.46021666, 0.76601307, 0.97592295, 1.        , 0.95626243,
       0.93954135, 0.9122807 , 0.94246575, 0.94200849, 0.9255079 ,
       0.97297297, 0.94911243, 0.92193919, 0.99454094, 0.99413681,
       0.95709571, 0.98487395, 0.97313433, 0.90145577, 0.91160221,
       0.95683453, 0.97393015, 0.98263534, 0.99424987, 0.97473684,
       0.86831276, 1.        ])]

mean_train_f1_score= 0.9400928726242548

mean_test_f1_score= 0.9308067817223938

              precision    recall  f1-score   support

          10       0.30      1.00      0.46       616
          40       1.00      0.62      0.77       472
          50       1.00      0.95      0.98       319
          60       1.00      1.00      1.00       150
        1140       1.00      0.92      0.96       525
        1160       1.00      0.89      0.94       763
        1180       1.00      0.84      0.91       155
        1280       1.00      0.89      0.94       965
        1281       1.00      0.89      0.94       374
```

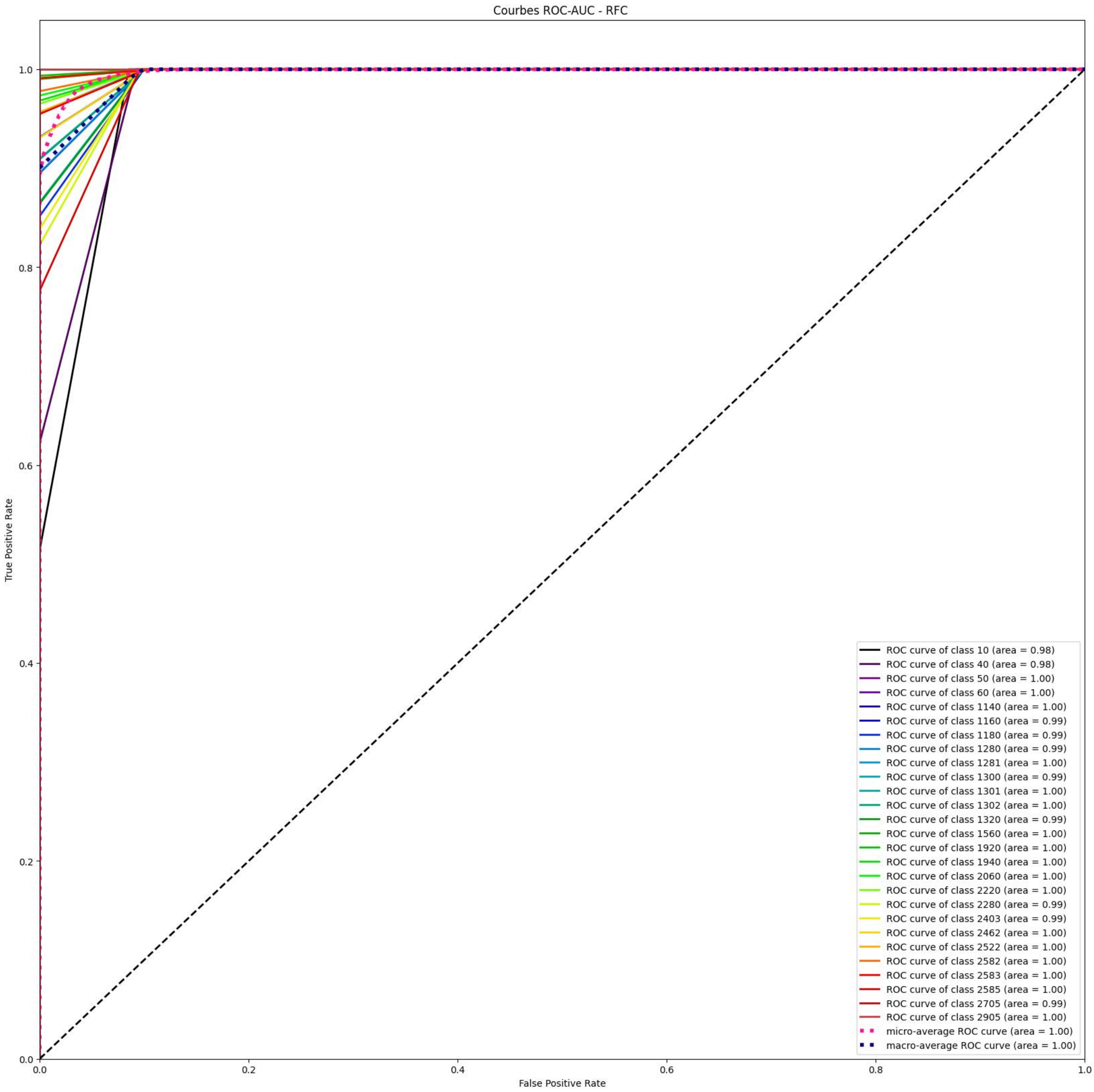
```
1300          1.00    0.86    0.93     952

1301          1.00    0.95    0.97     114

1302           1.00    0.90    0.95     444

1320          1.00    0.86    0.92     656

1560          1.00    0.99    0.99    1013

1920          1.00    0.99    0.99     772

1940           1.00    0.92    0.96     158

2060          1.00    0.97    0.98     906

2220          1.00    0.95    0.97     172

2280          1.00    0.82    0.90     981

2403          1.00    0.84    0.91     985

2462          1.00    0.92    0.96     290

2522          1.00    0.95    0.97    1043

2582          1.00    0.97    0.98     498
```



===========================CONFUSION MATRIX======================================



	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	179	293	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	15	0	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	44	0	0	0	481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	87	0	0	0	0	676	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	25	0	0	0	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	105	0	0	0	0	0	0	860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	41	0	0	0	0	0	0	0	333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	132	0	0	0	0	0	0	0	0	820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	6	0	0	0	0	0	0	0	0	0	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	43	0	0	0	0	0	0	0	0	0	0	401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	95	0	0	0	0	0	0	0	0	0	0	0	561	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	11	0	0	0	0	0	0	0	0	0	0	0	0	1002	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	9	0	0	0	0	0	0	0	0	0	0	0	0	0	763	0	0	0	0	0	0	0	0	0	0	0	0
1940	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	0	0	0	0	0	0	0	0	0	0	0
2060	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	879	0	0	0	0	0	0	0	0	0	0
2220	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	0	0	0	0	0	0	0	0	0
2280	176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	805	0	0	0	0	0	0	0	0
2403	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	825	0	0	0	0	0	0	0
2462	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	266	0	0	0	0	0	0
2522	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	990	0	0	0	0	0
2582	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	481	0	0	0	0
2583	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1902	0	0	0
2585	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	463	0	0
2705	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes ROC-AUC - RFC
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ROC curve of class 10 (area = 0.98)
ROC curve of class 40 (area = 0.98)
ROC curve of class 50 (area = 1.00)
ROC curve of class 60 (area = 1.00)
ROC curve of class 1140 (area = 1.00)
ROC curve of class 1160 (area = 0.99)
ROC curve of class 1180 (area = 0.99)
ROC curve of class 1280 (area = 0.99)
ROC curve of class 1281 (area = 1.00)
ROC curve of class 1300 (area = 0.99)
ROC curve of class 1301 (area = 1.00)
ROC curve of class 1302 (area = 1.00)
ROC curve of class 1320 (area = 0.99)
ROC curve of class 1560 (area = 1.00)
ROC curve of class 1920 (area = 1.00)
ROC curve of class 1940 (area = 1.00)
ROC curve of class 2060 (area = 1.00)
ROC curve of class 2220 (area = 1.00)
ROC curve of class 2280 (area = 0.99)
ROC curve of class 2403 (area = 0.99)
ROC curve of class 2462 (area = 1.00)
ROC curve of class 2522 (area = 1.00)
ROC curve of class 2582 (area = 1.00)
ROC curve of class 2583 (area = 1.00)
ROC curve of class 2585 (area = 1.00)
ROC curve of class 2705 (area = 0.99)
ROC curve of class 2905 (area = 1.00)
micro-average ROC curve (area = 1.00)
macro-average ROC curve (area = 1.00)

LREG (100 WORDS BY CODE) – 4MIN

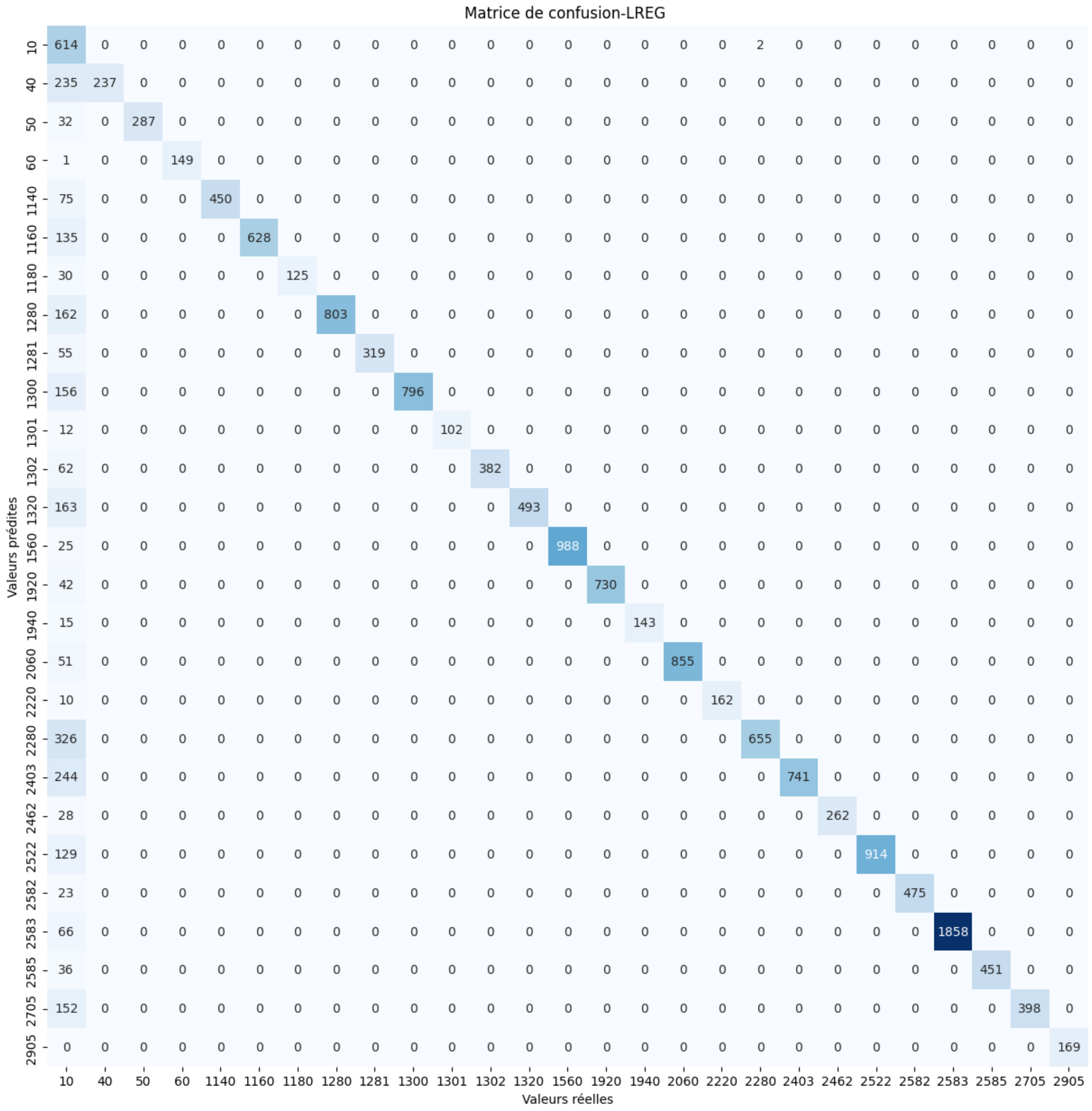
BEST_PARAMS: [{'C': 30}]

TRAIN_R2_SCORE = 0.8658603294232055

TEST_R2_SCORE = 0.8622135780708685

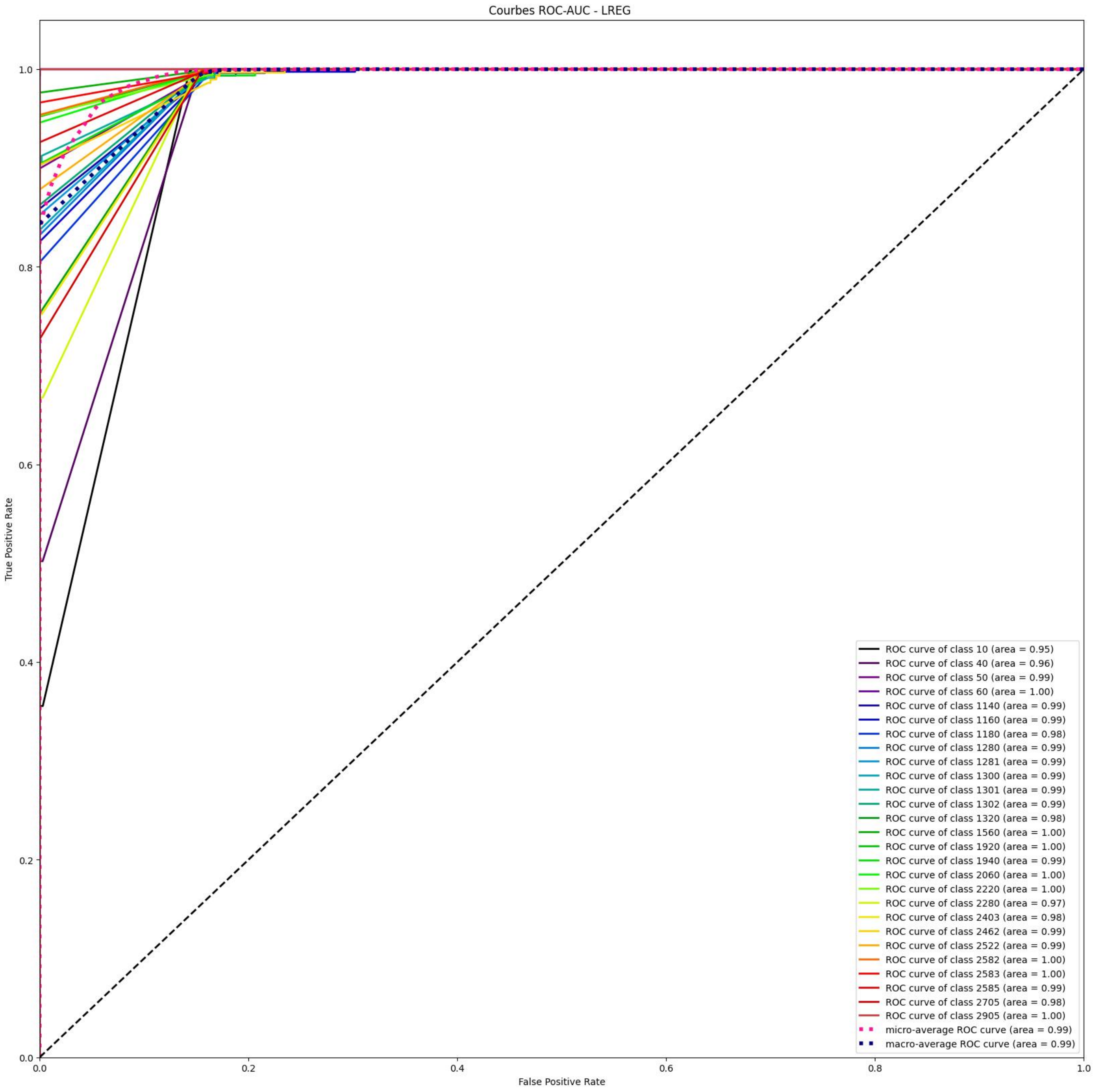
```
X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 2700) - (16453, 2700) - 65812 - 16453

estimator  LogisticRegression()

params     {'C': [5, 10, 20]}

train_f1_score = [array([0.36140046, 0.66355763, 0.94627105, 0.99273608, 0.93363162,
    0.9073154 , 0.89071038, 0.9119452 , 0.91848373, 0.90918919,
    0.9622438 , 0.92756133, 0.87660327, 0.98651802, 0.98189068,
    0.95114007, 0.97431555, 0.96634615, 0.79063803, 0.85167173,
    0.96040987, 0.93652531, 0.98114169, 0.98680361, 0.96119882,
    0.83593131, 1.        ])]

test_f1_score = [array([0.35135908, 0.66854725, 0.94719472, 0.99665552, 0.92307692,
    0.90294752, 0.89285714, 0.90837104, 0.92063492, 0.91075515,
    0.94444444, 0.92493947, 0.85813751, 0.98750625, 0.97203728,
    0.95016611, 0.97103918, 0.97005988, 0.7997558 , 0.85863268,
    0.94927536, 0.93408278, 0.97636177, 0.98254892, 0.96162047,
    0.83966245, 1.        ])]

train_mse_result =  456855.5308302437
```

test_mse_result = 477873.36564760224



Matrice de confusion-LREG

Valeurs prédites \ Valeurs réelles	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
40	235	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	32	0	287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	1	0	0	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	75	0	0	0	450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	135	0	0	0	0	628	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	30	0	0	0	0	0	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	162	0	0	0	0	0	0	803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	55	0	0	0	0	0	0	0	319	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	156	0	0	0	0	0	0	0	0	796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	12	0	0	0	0	0	0	0	0	0	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	62	0	0	0	0	0	0	0	0	0	0	382	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	163	0	0	0	0	0	0	0	0	0	0	0	493	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	25	0	0	0	0	0	0	0	0	0	0	0	0	988	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	42	0	0	0	0	0	0	0	0	0	0	0	0	0	730	0	0	0	0	0	0	0	0	0	0	0	0
1940	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	0	0	0	0	0	0	0	0	0	0	0
2060	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	855	0	0	0	0	0	0	0	0	0	0
2220	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	0	0	0	0	0	0	0	0	0
2280	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	655	0	0	0	0	0	0	0	0
2403	244	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	741	0	0	0	0	0	0	0
2462	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	262	0	0	0	0	0	0
2522	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	914	0	0	0	0	0
2582	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	475	0	0	0	0
2583	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1858	0	0	0
2585	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	451	0	0
2705	152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	398	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes ROC-AUC - LREG
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ROC curve of class 10 (area = 0.95)
ROC curve of class 40 (area = 0.96)
ROC curve of class 50 (area = 0.99)
ROC curve of class 60 (area = 1.00)
ROC curve of class 1140 (area = 0.99)
ROC curve of class 1160 (area = 0.99)
ROC curve of class 1180 (area = 0.98)
ROC curve of class 1280 (area = 0.99)
ROC curve of class 1281 (area = 0.99)
ROC curve of class 1300 (area = 0.99)
ROC curve of class 1301 (area = 0.99)
ROC curve of class 1302 (area = 0.99)
ROC curve of class 1320 (area = 0.98)
ROC curve of class 1560 (area = 1.00)
ROC curve of class 1920 (area = 1.00)
ROC curve of class 1940 (area = 0.99)
ROC curve of class 2060 (area = 1.00)
ROC curve of class 2220 (area = 1.00)
ROC curve of class 2280 (area = 0.97)
ROC curve of class 2403 (area = 0.98)
ROC curve of class 2462 (area = 0.99)
ROC curve of class 2522 (area = 0.99)
ROC curve of class 2582 (area = 1.00)
ROC curve of class 2583 (area = 1.00)
ROC curve of class 2585 (area = 0.99)
ROC curve of class 2705 (area = 0.98)
ROC curve of class 2905 (area = 1.00)
micro-average ROC curve (area = 0.99)
macro-average ROC curve (area = 0.99)

RBF (100 WORDS BY CODE)

TRAIN_R2_SCORE = 0.8660274721935209

TEST_R2_SCORE = 0.8619704613140461

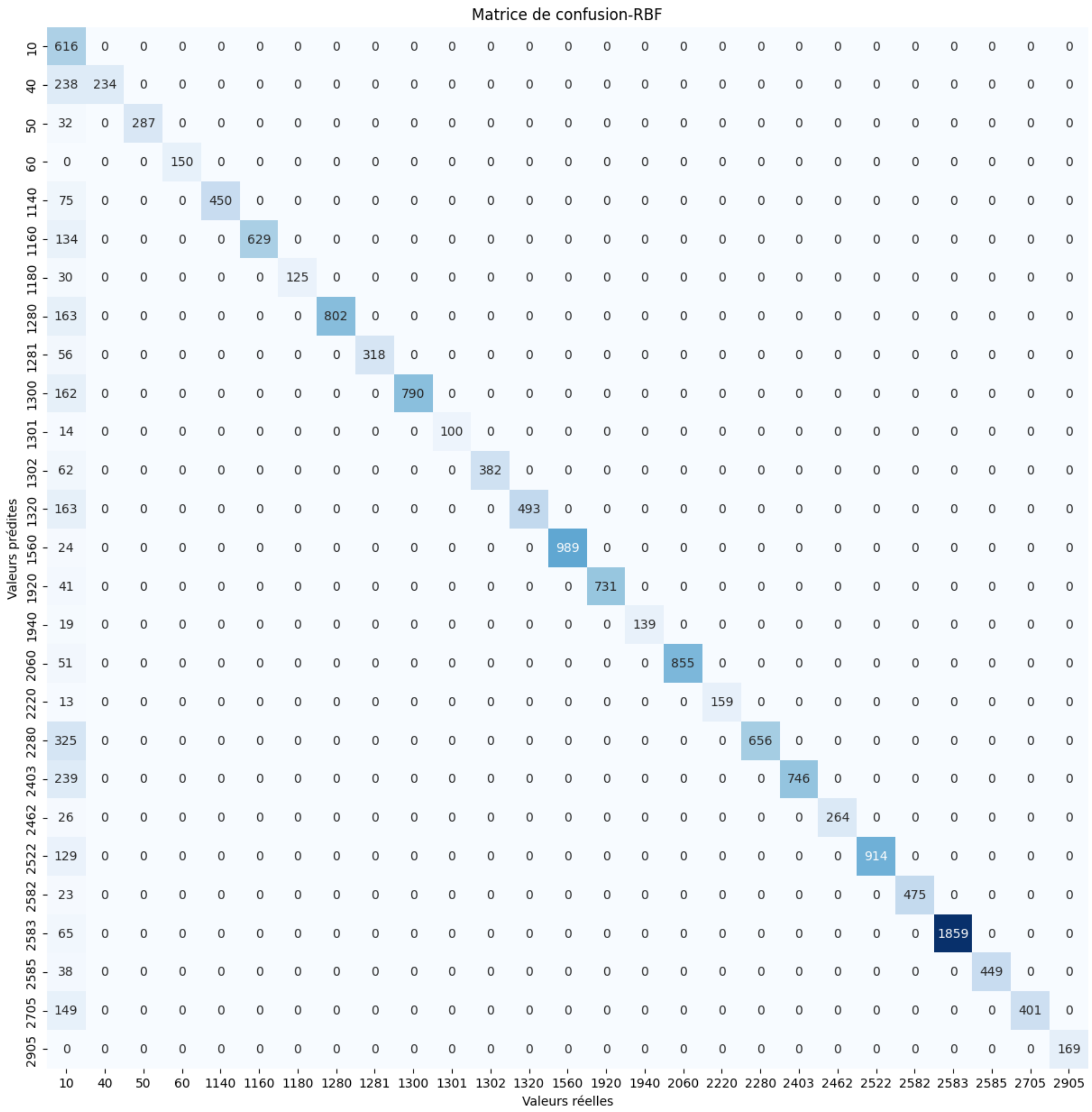
BEST_PARAMS: [{'MAX_FEATURES': 'SQRT', 'MIN_SAMPLES_SPLIT': 10}]

X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 2700) - (16453, 2700) - 65812 - 16453

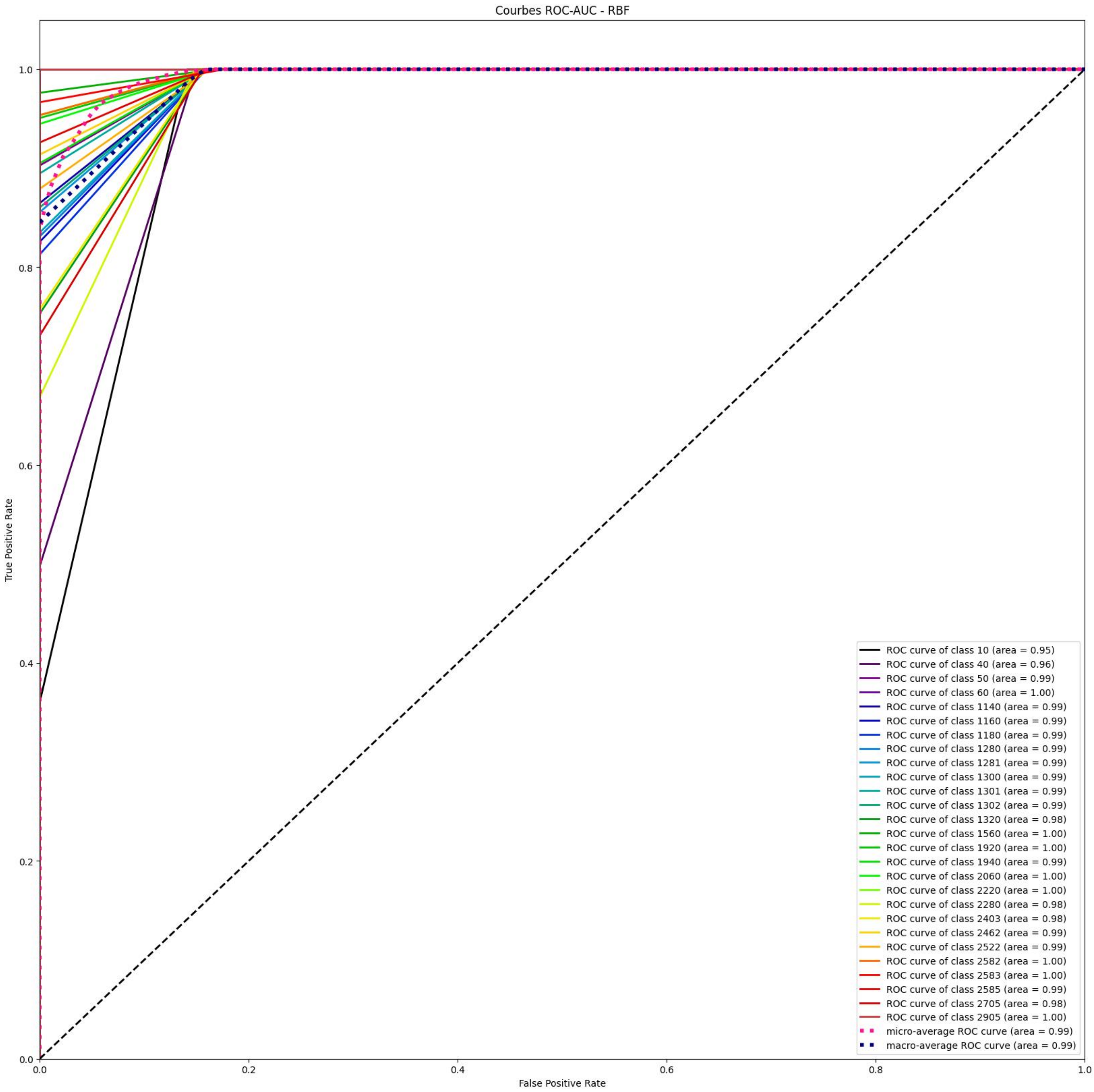
```
estimator                    RandomForestClassifier()

params    {'name': 'RBF', 'estimator': ensemble.RandomForestClassifier(), 'params': {'max_features': ["sqrt", None],
                                  'min_samples_split': [1, 10]}
                           },
                          {'name': 'SVC',  'estimator': svm.SVC(),
                           'params': {'kernel':('linear', 'rbf'), 'C':[1, 10]}
                           }
```

```
train_f1_score = [array([0.36168826, 0.66088117, 0.94627105, 0.99273608, 0.93363162,
     0.9073154 , 0.89071038, 0.9119452 , 0.91848373, 0.90918919,
     0.9622438 , 0.92756133, 0.87660327, 0.98651802, 0.98189068,
     0.94857143, 0.97431555, 0.96634615, 0.79063803, 0.85341426,
     0.96040987, 0.93725222, 0.98140127, 0.98680361, 0.96203209,
     0.83623877, 1.        ])]
test_f1_score = [array([0.35169854, 0.66288952, 0.94719472, 1.        , 0.92307692,
     0.90373563, 0.89285714, 0.90775325, 0.91907514, 0.90700344,
     0.93457944, 0.92493947, 0.85813751, 0.98801199, 0.97272122,
     0.93602694, 0.97103918, 0.96072508, 0.8014661 , 0.86192952,
     0.95306859, 0.93408278, 0.97636177, 0.98281787, 0.95940171,
     0.84332282, 1.        ])]
train_mse_result =  455162.75148909015
test_mse_result = 475895.7078344375
```



Matrice de confusion-RBF

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	238	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	32	0	287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	75	0	0	0	450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	134	0	0	0	0	629	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	30	0	0	0	0	0	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	163	0	0	0	0	0	0	802	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	56	0	0	0	0	0	0	0	318	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	162	0	0	0	0	0	0	0	0	790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	14	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	62	0	0	0	0	0	0	0	0	0	0	382	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	163	0	0	0	0	0	0	0	0	0	0	0	493	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	24	0	0	0	0	0	0	0	0	0	0	0	0	989	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	41	0	0	0	0	0	0	0	0	0	0	0	0	0	731	0	0	0	0	0	0	0	0	0	0	0	0
1940	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139	0	0	0	0	0	0	0	0	0	0	0
2060	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	855	0	0	0	0	0	0	0	0	0	0
2220	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	0	0	0	0	0	0	0	0	0
2280	325	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	656	0	0	0	0	0	0	0	0
2403	239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	746	0	0	0	0	0	0	0
2462	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	264	0	0	0	0	0	0
2522	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	914	0	0	0	0	0
2582	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	475	0	0	0	0
2583	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1859	0	0	0
2585	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	449	0	0
2705	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	401	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes ROC-AUC - RBF
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ROC curve of class 10 (area = 0.95)
ROC curve of class 40 (area = 0.96)
ROC curve of class 50 (area = 0.99)
ROC curve of class 60 (area = 1.00)
ROC curve of class 1140 (area = 0.99)
ROC curve of class 1160 (area = 0.99)
ROC curve of class 1180 (area = 0.99)
ROC curve of class 1280 (area = 0.99)
ROC curve of class 1281 (area = 0.99)
ROC curve of class 1300 (area = 0.99)
ROC curve of class 1301 (area = 0.99)
ROC curve of class 1302 (area = 0.99)
ROC curve of class 1320 (area = 0.98)
ROC curve of class 1560 (area = 1.00)
ROC curve of class 1920 (area = 1.00)
ROC curve of class 1940 (area = 0.99)
ROC curve of class 2060 (area = 1.00)
ROC curve of class 2220 (area = 1.00)
ROC curve of class 2280 (area = 0.98)
ROC curve of class 2403 (area = 0.98)
ROC curve of class 2462 (area = 0.99)
ROC curve of class 2522 (area = 0.99)
ROC curve of class 2582 (area = 1.00)
ROC curve of class 2583 (area = 1.00)
ROC curve of class 2585 (area = 0.99)
ROC curve of class 2705 (area = 0.98)
ROC curve of class 2905 (area = 1.00)
micro-average ROC curve (area = 0.99)
macro-average ROC curve (area = 0.99)

NAIVE BAYES (100 WORDS BY CODE) – 11SEC TEMPS D'EXCUCUTION

PARAMS {'ALPHA': [1]}

TRAIN_R2_SCORE = 0.8464261836747098

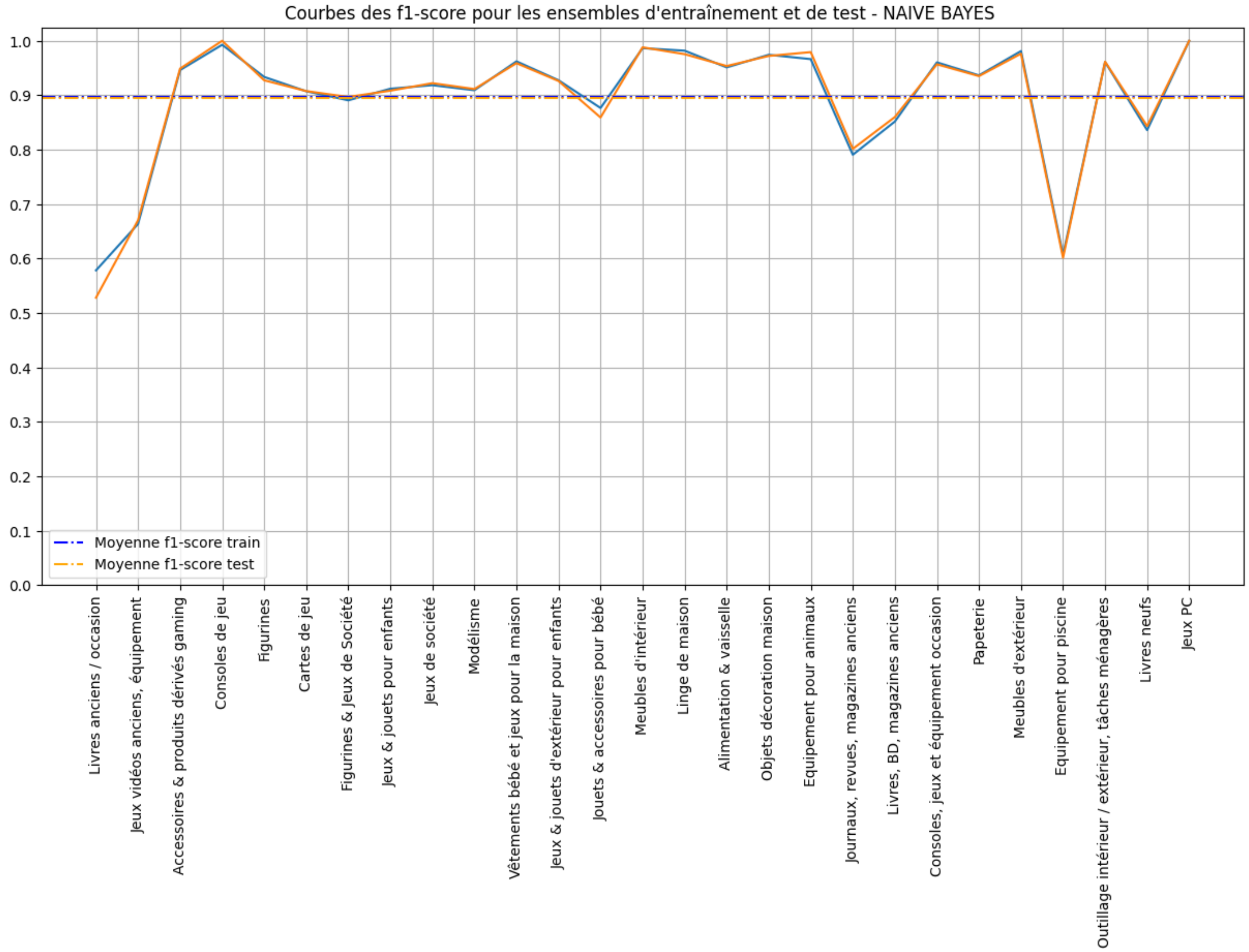
TEST_R2_SCORE = 0.8450738467148848

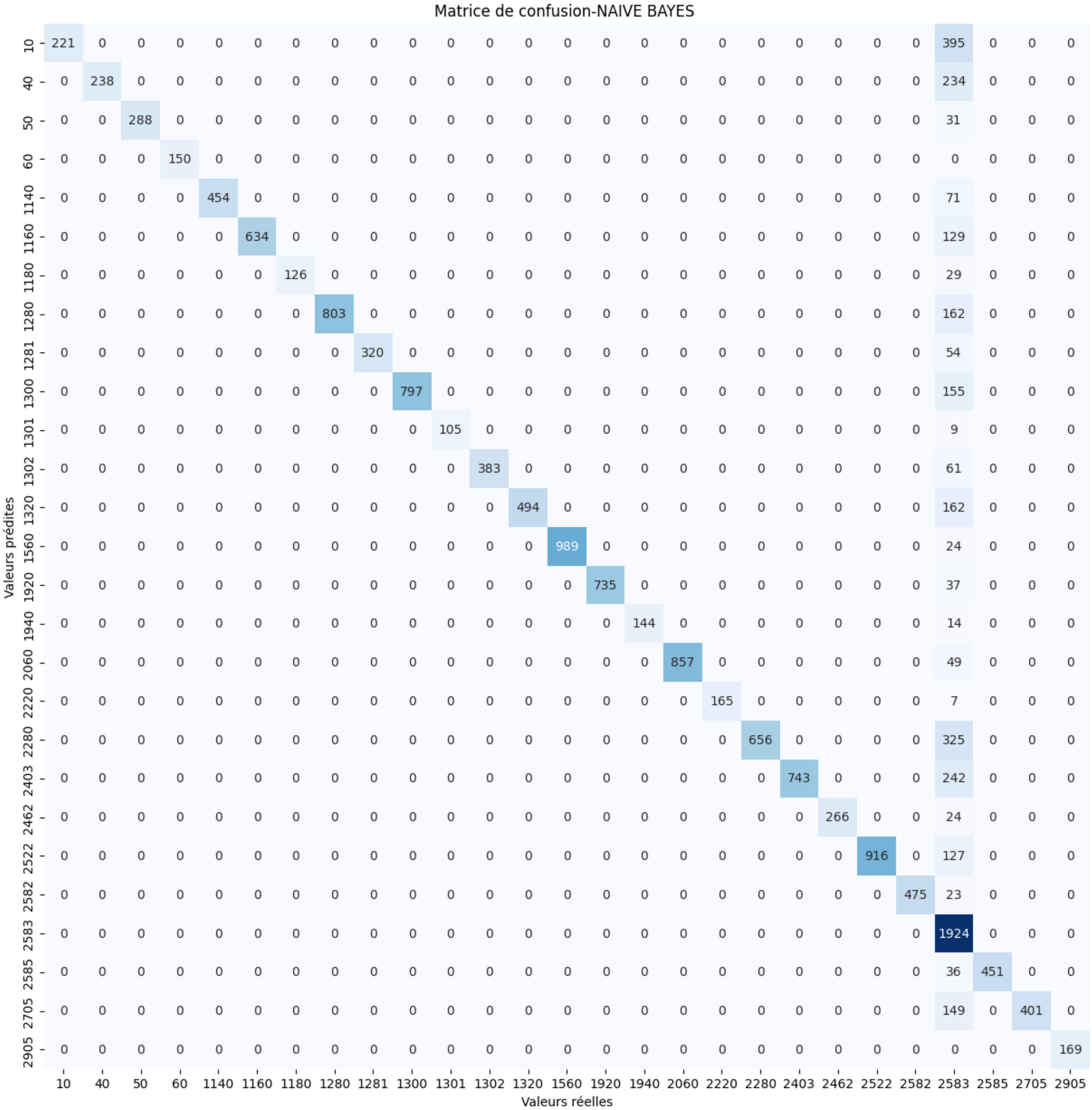
MEAN_TRAIN_F1_SCORE= 0.8964021730543796

MEAN_TEST_F1_SCORE= 0.895199049313926

X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 2700) - (16453, 2700) - 65812 - 16453



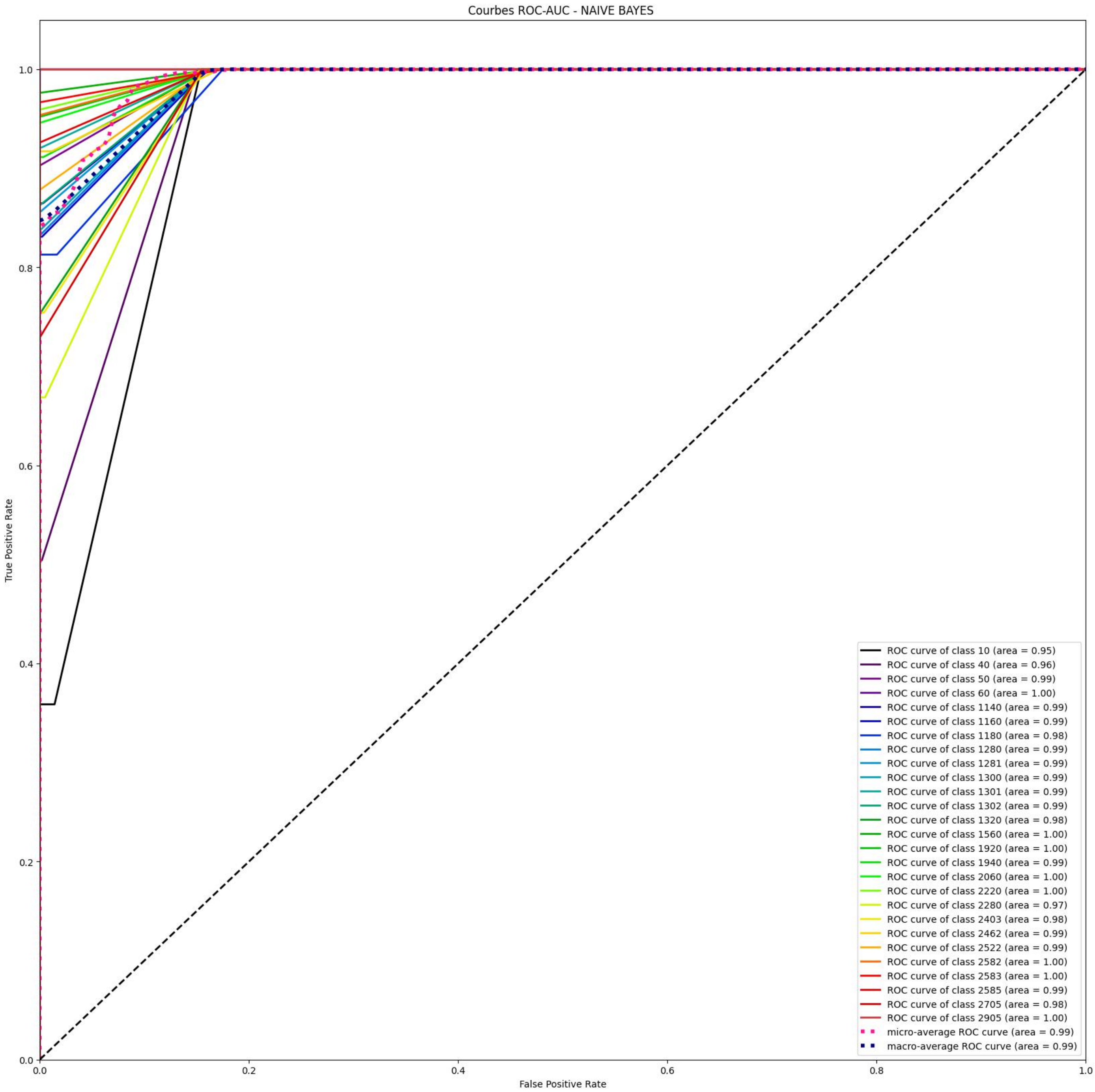


Matrice de confusion-NAIVE BAYES

Valeurs prédites

Valeurs réelles

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	395	0	0	0
40	0	238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	234	0	0	0
50	0	0	288	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0
60	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	0	0	0	0	454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	0	0	0
1160	0	0	0	0	0	634	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	0	0	0
1180	0	0	0	0	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0
1280	0	0	0	0	0	0	0	803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	0	0	0
1281	0	0	0	0	0	0	0	0	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	0	0	0
1300	0	0	0	0	0	0	0	0	0	797	0	0	0	0	0	0	0	0	0	0	0	0	0	155	0	0	0
1301	0	0	0	0	0	0	0	0	0	0	105	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0
1302	0	0	0	0	0	0	0	0	0	0	0	383	0	0	0	0	0	0	0	0	0	0	0	61	0	0	0
1320	0	0	0	0	0	0	0	0	0	0	0	0	494	0	0	0	0	0	0	0	0	0	0	162	0	0	0
1560	0	0	0	0	0	0	0	0	0	0	0	0	0	989	0	0	0	0	0	0	0	0	0	24	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	735	0	0	0	0	0	0	0	0	37	0	0	0
1940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	0	0	0	0	0	0	0	14	0	0	0
2060	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	857	0	0	0	0	0	0	49	0	0	0
2220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	165	0	0	0	0	0	7	0	0	0
2280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	656	0	0	0	0	325	0	0	0
2403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	743	0	0	0	242	0	0	0
2462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	266	0	0	24	0	0	0
2522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	916	0	127	0	0	0
2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	475	23	0	0	0
2583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1924	0	0	0
2585	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	451	0	0
2705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	149	0	401	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169



RF (100 WORDS BY CODE):

FITTING 3 FOLDS FOR EACH OF 1 CANDIDATES, TOTALLING 3 FITS

TRAIN_R2_SCORE = 0.8693095484106242

TEST_R2_SCORE = 0.8640977329362426

train_mse_result = 446904.01537713484

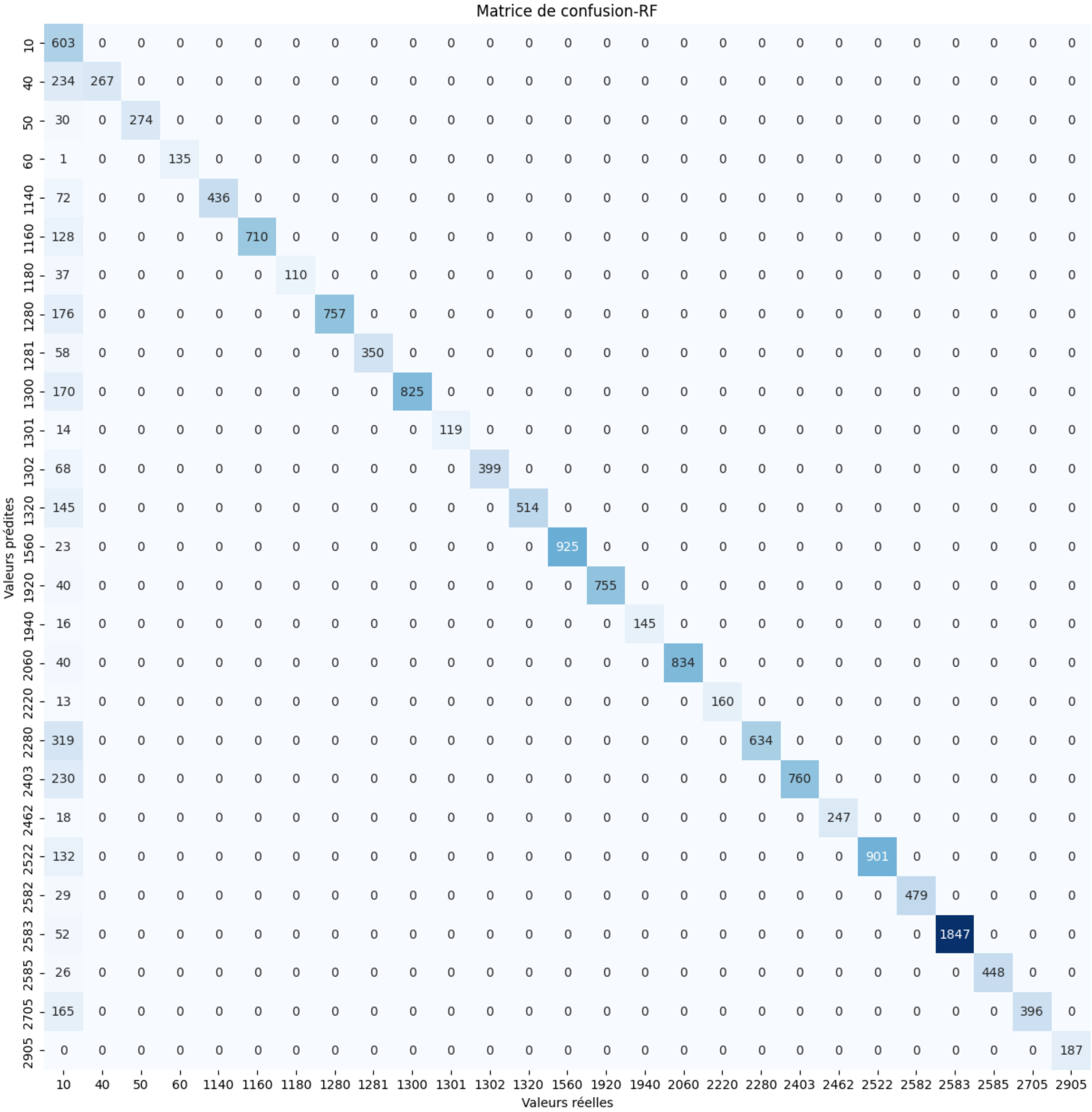
test_mse_result = 465541.4230231569

best_params: [{'max_features': 'sqrt', 'min_samples_split': 100}]

===========================CONFUSION MATRIX==

3. Use SEABORN to draw confusion_matrix---

Confusion matrix as graph with Seaborn :



Matrice de confusion-RF

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	234	267	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	30	0	274	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	1	0	0	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	72	0	0	0	436	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	128	0	0	0	0	710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	37	0	0	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	176	0	0	0	0	0	0	757	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	58	0	0	0	0	0	0	0	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	170	0	0	0	0	0	0	0	0	825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	14	0	0	0	0	0	0	0	0	0	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	68	0	0	0	0	0	0	0	0	0	0	399	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	145	0	0	0	0	0	0	0	0	0	0	0	514	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	23	0	0	0	0	0	0	0	0	0	0	0	0	925	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	40	0	0	0	0	0	0	0	0	0	0	0	0	0	755	0	0	0	0	0	0	0	0	0	0	0	0
1940	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	0	0	0	0	0	0	0	0	0	0	0
2060	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	834	0	0	0	0	0	0	0	0	0	0
2220	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160	0	0	0	0	0	0	0	0	0
2280	319	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	634	0	0	0	0	0	0	0	0
2403	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	760	0	0	0	0	0	0	0
2462	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	247	0	0	0	0	0	0
2522	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	901	0	0	0	0	0
2582	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	479	0	0	0	0
2583	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1847	0	0	0
2585	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	448	0	0
2705	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	396	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	187

SVC (100 WORDS BY CODE)

TRAIN_R2_SCORE = 0.8660274721935209

TEST_R2_SCORE = 0.8574120221236249

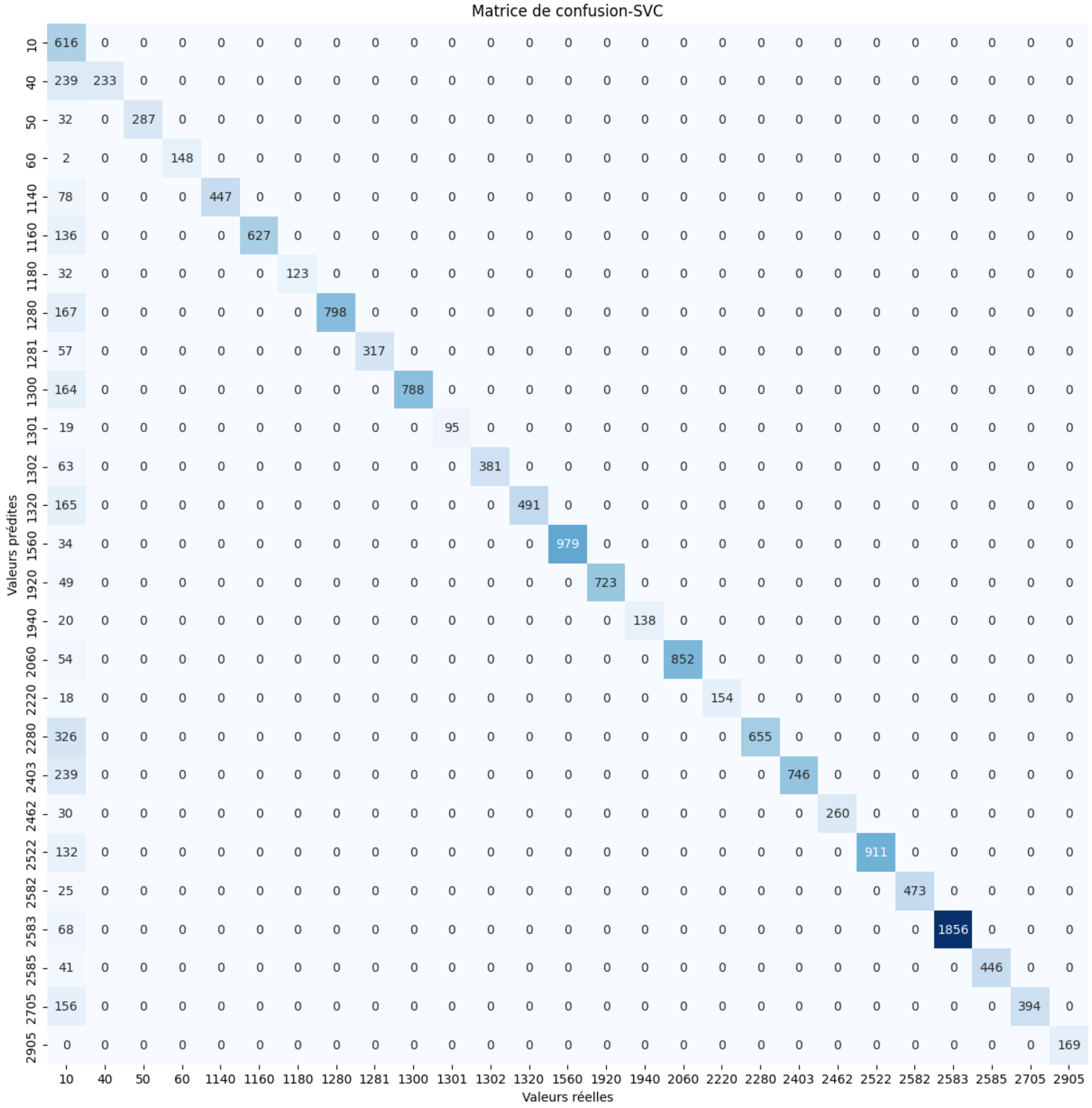
BEST_PARAMS: [{'C': 10, 'KERNEL': 'LINEAR'}]

params   {'kernel': ('linear', 'rbf'), 'C': [10, 20]}

X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 2700) - (16453, 2700) - 65812 - 16453

```
train_f1_score = [array([0.36168826, 0.66088117, 0.94627105, 0.99273608, 0.93363162,
       0.9073154 , 0.89071038, 0.9119452 , 0.91848373, 0.90918919,
       0.9622438 , 0.92756133, 0.87660327, 0.98651802, 0.98189068,
       0.94857143, 0.97431555, 0.96634615, 0.79063803, 0.85341426,
       0.96040987, 0.93725222, 0.98140127, 0.98680361, 0.96203209,
       0.83623877, 1.        ])]
test_f1_score = [array([0.34432644, 0.66099291, 0.94719472, 0.99328859, 0.91975309,
       0.90215827, 0.88489209, 0.9052751 , 0.91751085, 0.90574713,
       0.90909091, 0.92363636, 0.85614647, 0.98293173, 0.96722408,
       0.93243243, 0.96928328, 0.94478528, 0.8007335 , 0.86192952,
       0.94545455, 0.93244626, 0.97425335, 0.98201058, 0.95605573,
       0.83474576, 1.        ])]
train_mse_result =  455162.75148909015
test_mse_result = 492912.0065641524
```



	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	239	233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	32	0	287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	2	0	0	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	78	0	0	0	447	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	136	0	0	0	0	627	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	32	0	0	0	0	0	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	167	0	0	0	0	0	0	798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	57	0	0	0	0	0	0	0	317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	164	0	0	0	0	0	0	0	0	788	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	19	0	0	0	0	0	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	63	0	0	0	0	0	0	0	0	0	0	381	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	165	0	0	0	0	0	0	0	0	0	0	0	491	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	34	0	0	0	0	0	0	0	0	0	0	0	0	979	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	49	0	0	0	0	0	0	0	0	0	0	0	0	0	723	0	0	0	0	0	0	0	0	0	0	0	0
1940	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	138	0	0	0	0	0	0	0	0	0	0	0
2060	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	852	0	0	0	0	0	0	0	0	0	0
2220	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154	0	0	0	0	0	0	0	0	0
2280	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	655	0	0	0	0	0	0	0	0
2403	239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	746	0	0	0	0	0	0	0
2462	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	260	0	0	0	0	0	0
2522	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	911	0	0	0	0	0
2582	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	473	0	0	0	0
2583	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1856	0	0	0
2585	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	446	0	0
2705	156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	394	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169

KNN (300 WORD BY CODE)

TRAIN_R2_SCORE = 0.9067799185558865

TEST_R2_SCORE = 0.9002613505135841

ESTIMATOR KNEIGHBORSCLASSIFIER()

PARAMS {'N_NEIGHBORS': [10]}

X_train.shape - X_test.shape - len(y_train) - len(y_test)

(65812, 8100) - (16453, 8100) - 65812 - 16453

```
Fitting 3 folds for each of 1 candidates, totalling 3 fits

train_f1_score = [array([0.75349301, 0.8144208 , 0.9837587 , 0.98947368, 0.42818645,
       0.96005218, 0.90762332, 0.94754279, 0.95120364, 0.92673847,
       0.97002141, 0.95146727, 0.93545683, 0.99200619, 0.99376026,
       0.94339623, 0.98420685, 0.964687  , 0.89900759, 0.92226501,
       0.98637602, 0.97737438, 0.98398983, 0.99484071, 0.96810207,
       0.799908  , 0.97447119])]

test_f1_score = [array([0.74541752, 0.8035488 , 0.98245614, 0.97260274, 0.41079812,
       0.9569378 , 0.90070922, 0.94072448, 0.95384615, 0.9218573 ,
       0.95412844, 0.94033413, 0.92193919, 0.98801199, 0.99282453,
       0.88732394, 0.97972973, 0.94153846, 0.91482301, 0.92876563,
       0.97707231, 0.97795198, 0.96465696, 0.99503787, 0.96051227,
       0.77019749, 0.95031056])]
```

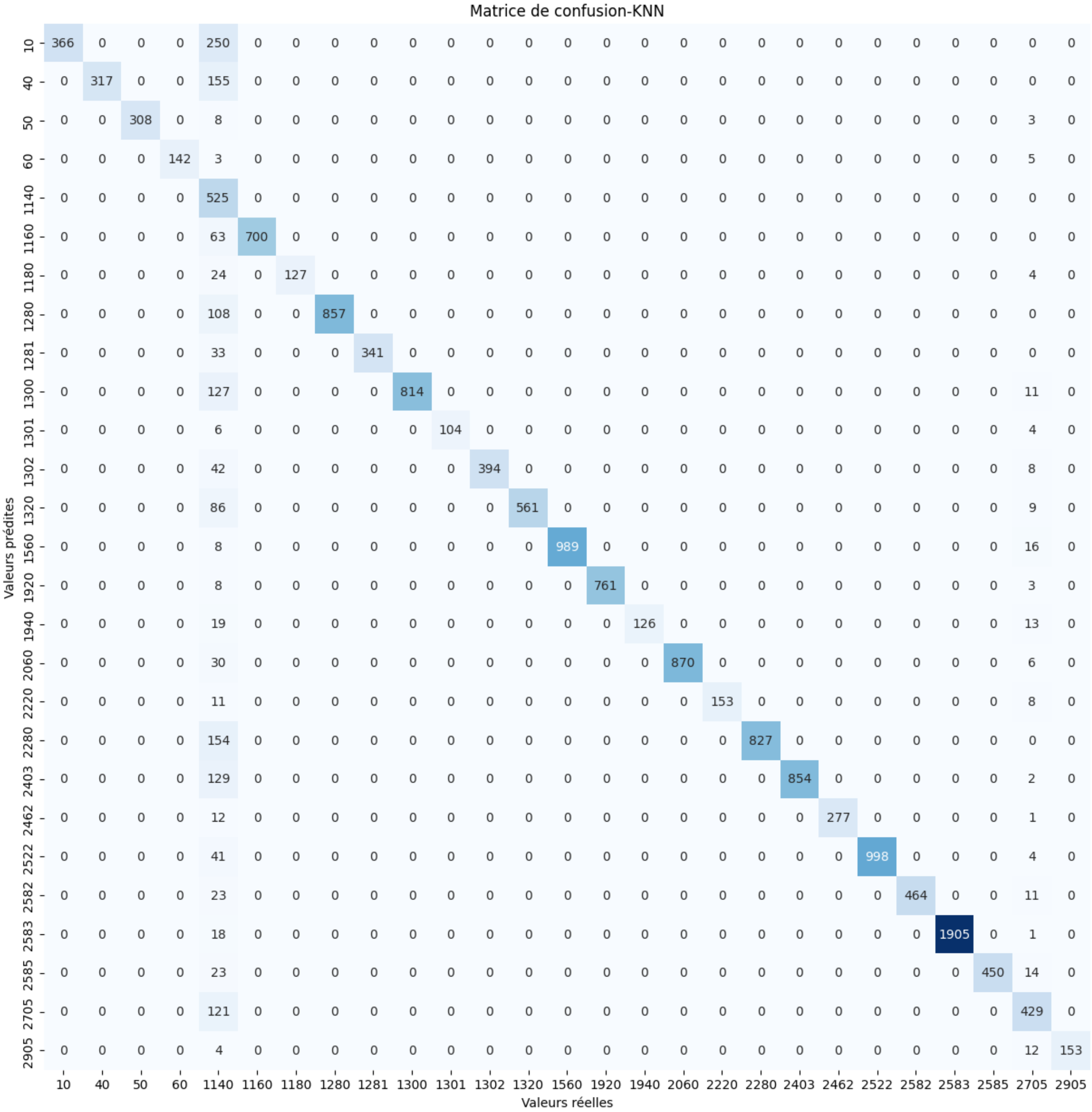
train_mse_result = 96349.62113292409

test_mse_result = 103203.23928766791

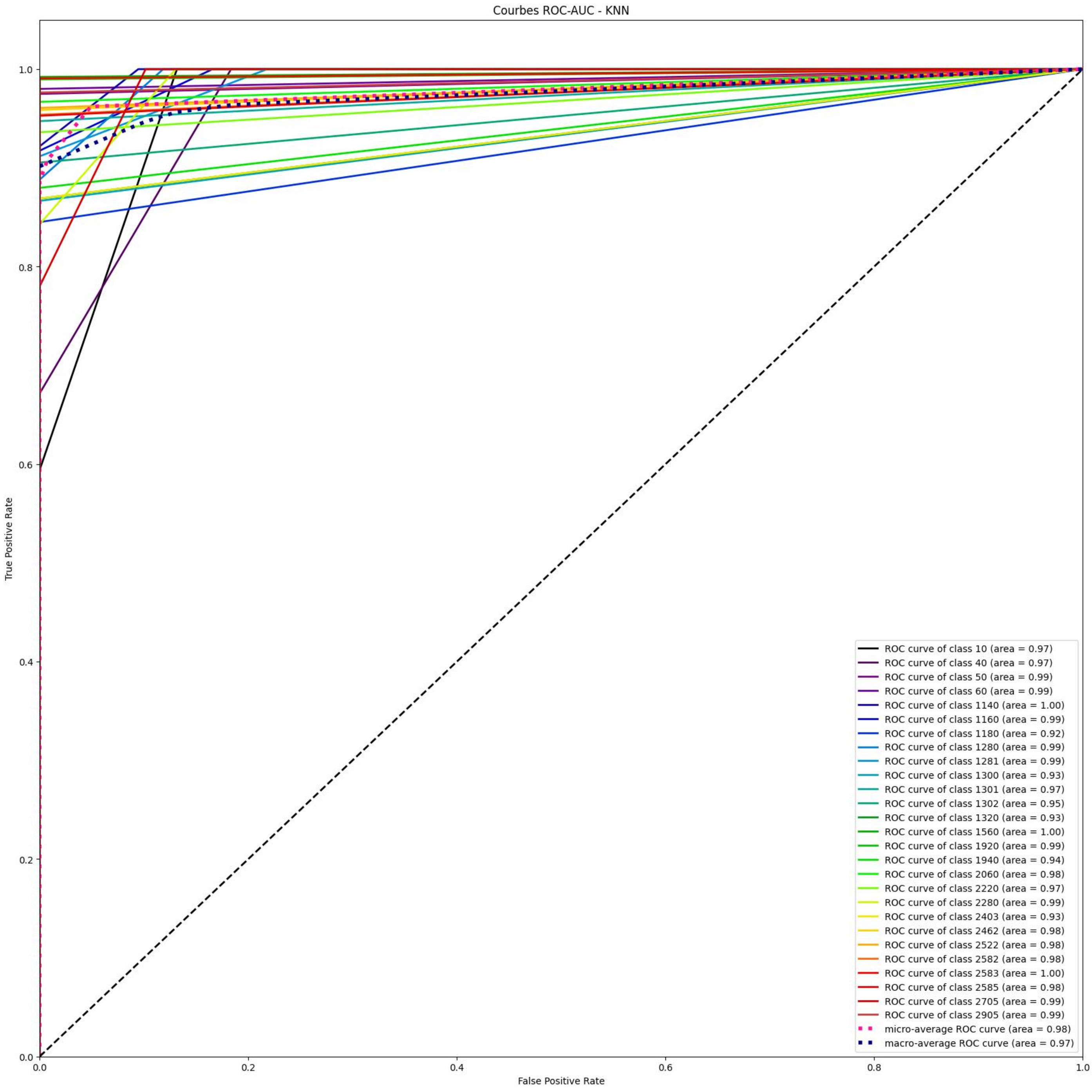
best_params: [{'n_neighbors': 10}]

============================CONFUSION MATRIX=======================================

Matrice de confusion-KNN



	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	366	0	0	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	317	0	0	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	308	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
60	0	0	0	142	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
1140	0	0	0	0	525	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	0	0	0	0	63	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	0	0	0	0	24	0	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
1280	0	0	0	0	108	0	0	857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	0	0	0	0	33	0	0	0	341	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	127	0	0	0	0	814	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
1301	0	0	0	0	6	0	0	0	0	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
1302	0	0	0	0	42	0	0	0	0	0	0	394	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
1320	0	0	0	0	86	0	0	0	0	0	0	0	561	0	0	0	0	0	0	0	0	0	0	0	0	9	0
1560	0	0	0	0	8	0	0	0	0	0	0	0	0	989	0	0	0	0	0	0	0	0	0	0	0	16	0
1920	0	0	0	0	8	0	0	0	0	0	0	0	0	0	761	0	0	0	0	0	0	0	0	0	0	3	0
1940	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	126	0	0	0	0	0	0	0	0	0	13	0
2060	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	870	0	0	0	0	0	0	0	0	6	0
2220	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	153	0	0	0	0	0	0	0	8	0
2280	0	0	0	0	154	0	0	0	0	0	0	0	0	0	0	0	0	0	827	0	0	0	0	0	0	0	0
2403	0	0	0	0	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	854	0	0	0	0	0	2	0
2462	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	277	0	0	0	0	1	0
2522	0	0	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	998	0	0	0	4	0
2582	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	464	0	0	11	0
2583	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1905	0	1	0
2585	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	450	14	0
2705	0	0	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	429	0
2905	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	153


Courbes ROC-AUC - KNN
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ROC curve of class 10 (area = 0.97)
ROC curve of class 40 (area = 0.97)
ROC curve of class 50 (area = 0.99)
ROC curve of class 60 (area = 0.99)
ROC curve of class 1140 (area = 1.00)
ROC curve of class 1160 (area = 0.99)
ROC curve of class 1180 (area = 0.92)
ROC curve of class 1280 (area = 0.99)
ROC curve of class 1281 (area = 0.99)
ROC curve of class 1300 (area = 0.93)
ROC curve of class 1301 (area = 0.97)
ROC curve of class 1302 (area = 0.95)
ROC curve of class 1320 (area = 0.93)
ROC curve of class 1560 (area = 1.00)
ROC curve of class 1920 (area = 0.99)
ROC curve of class 1940 (area = 0.94)
ROC curve of class 2060 (area = 0.98)
ROC curve of class 2220 (area = 0.97)
ROC curve of class 2280 (area = 0.99)
ROC curve of class 2403 (area = 0.93)
ROC curve of class 2462 (area = 0.98)
ROC curve of class 2522 (area = 0.98)
ROC curve of class 2582 (area = 0.98)
ROC curve of class 2583 (area = 1.00)
ROC curve of class 2585 (area = 0.98)
ROC curve of class 2705 (area = 0.99)
ROC curve of class 2905 (area = 0.99)
micro-average ROC curve (area = 0.98)
macro-average ROC curve (area = 0.97)

NAIVE BAYES (300 WORDS BY CODE) – 30SEC TEMPS D'EXCUCUTION

ESTIMATOR MULTINOMIALNB()

PARAMS {'ALPHA': [1]}

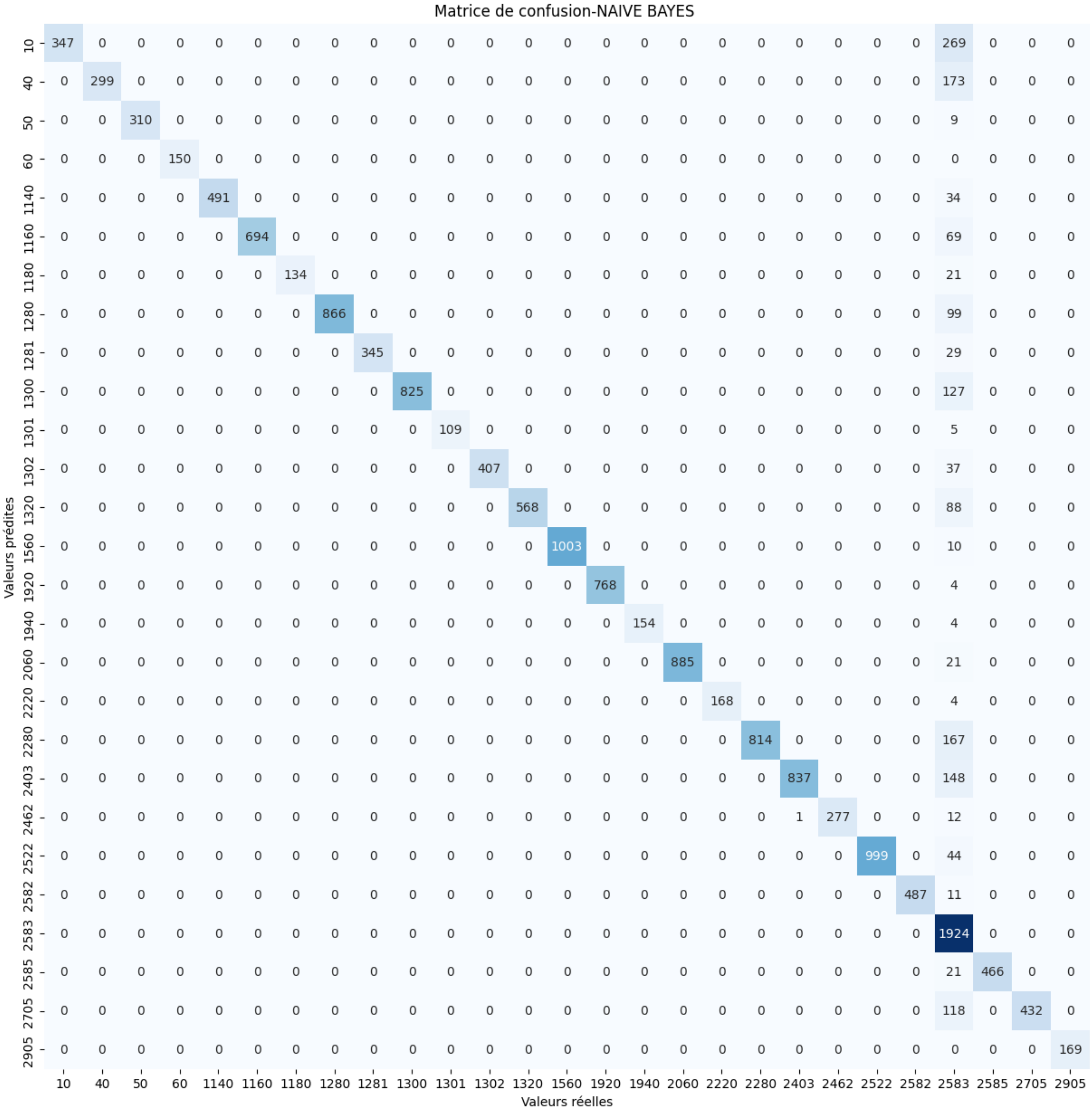
TRAIN_R2_SCORE = 0.9078283595696833

TEST_R2_SCORE = 0.9073117364614356

MEAN_TRAIN_F1_SCORE= 0.9392493667037067

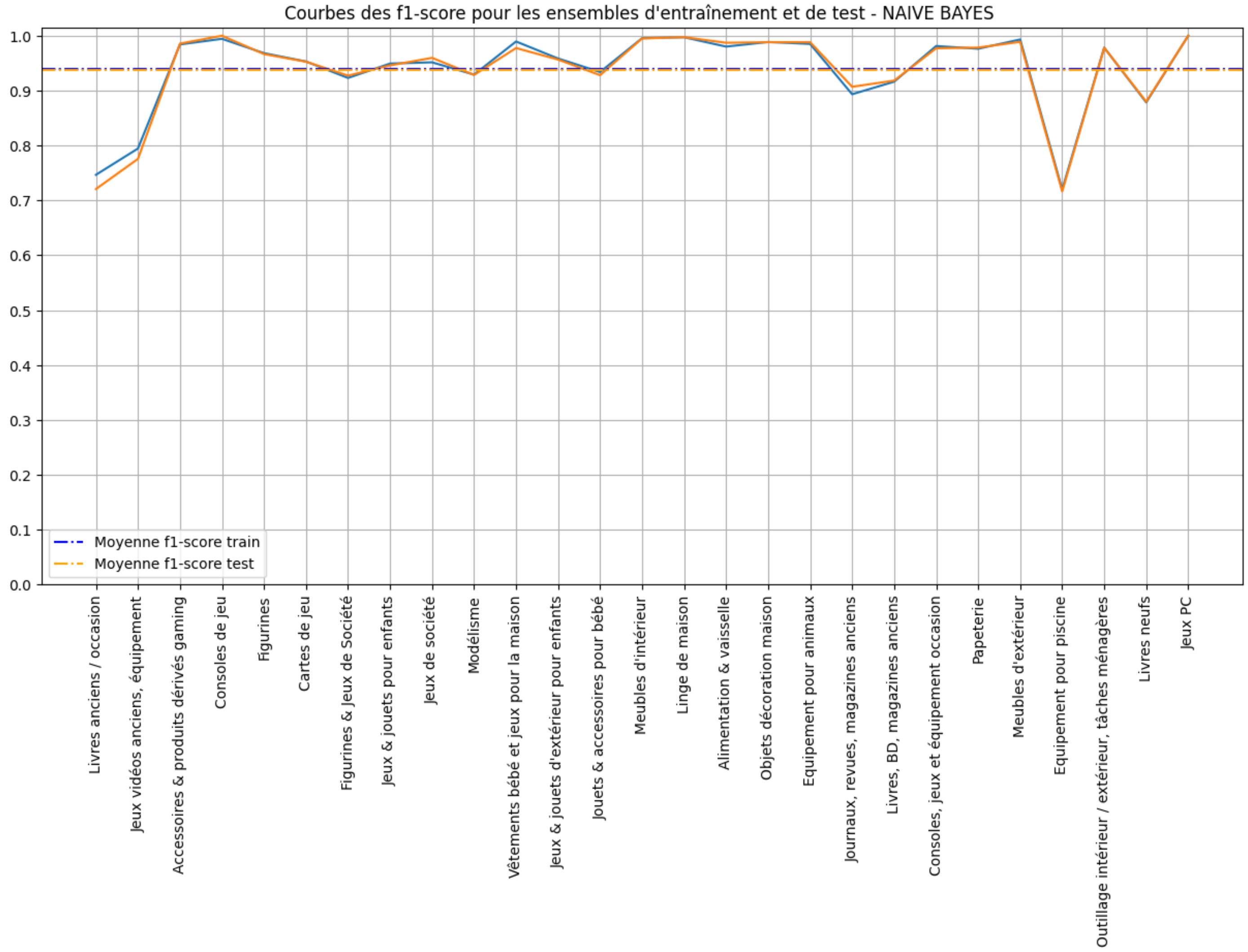
MEAN_TEST_F1_SCORE= 0.9379498799117439

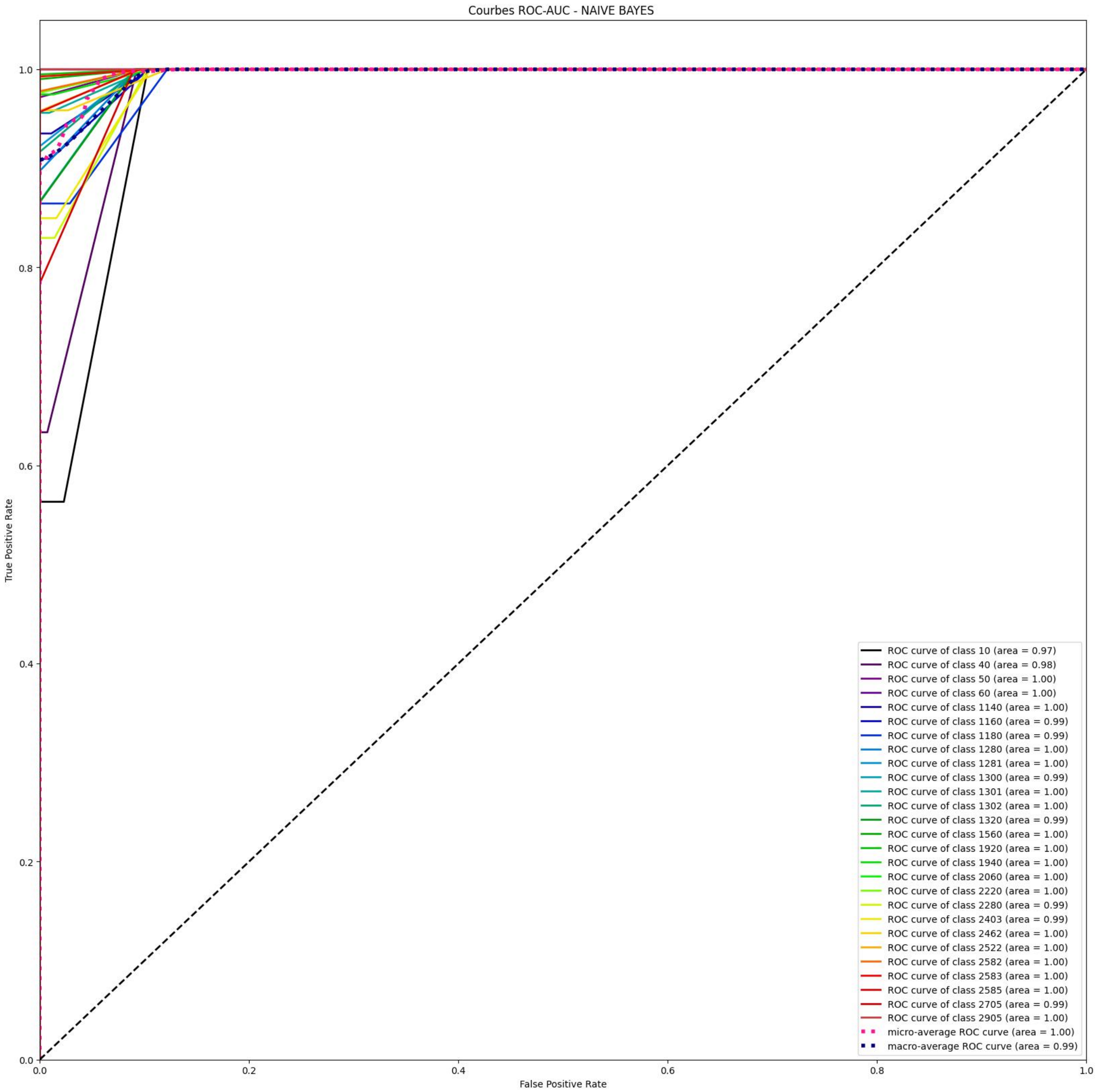
```
train_mse_result =  229948.6231842217

test_mse_result = 236261.5843919042

best_params: [{'alpha': 1}]

train_f1_score = [array([0.74661315, 0.79447115, 0.98415153, 0.99435939, 0.96825397,

    0.95305318, 0.92307692, 0.94928335, 0.95154472, 0.92915893,

    0.9894958 , 0.95852018, 0.93389297, 0.99550302, 0.99721813,

    0.98020586, 0.98858892, 0.98505114, 0.89335485, 0.9162604 ,

    0.98128708, 0.97629708, 0.99320071, 0.71987437, 0.97842105,

    0.87859506, 1.        ])]

test_f1_score = [array([0.72066459, 0.77561608, 0.98569157, 1.        , 0.96653543,

    0.95264242, 0.92733564, 0.94593119, 0.9596662 , 0.92853123,

    0.97757848, 0.95652174, 0.92810458, 0.99503968, 0.9974026 ,

    0.98717949, 0.98827471, 0.98823529, 0.90696379, 0.91826659,

    0.97707231, 0.9784525 , 0.98883249, 0.71630678, 0.97796432,

    0.87983707, 1.        ])]

mean_train_f1_score= 0.9392493667037067

mean_test_f1_score= 0.9379498799117439
```



Matrice de confusion-NAIVE BAYES

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	347	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	269	0	0	0
40	0	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	173	0	0	0
50	0	0	310	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0
60	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	0	0	0	0	491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0	0	0
1160	0	0	0	0	0	694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	0	0
1180	0	0	0	0	0	0	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0
1280	0	0	0	0	0	0	0	866	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	0	0
1281	0	0	0	0	0	0	0	0	345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0
1300	0	0	0	0	0	0	0	0	0	825	0	0	0	0	0	0	0	0	0	0	0	0	0	127	0	0	0
1301	0	0	0	0	0	0	0	0	0	0	109	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
1302	0	0	0	0	0	0	0	0	0	0	0	407	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0
1320	0	0	0	0	0	0	0	0	0	0	0	0	568	0	0	0	0	0	0	0	0	0	0	88	0	0	0
1560	0	0	0	0	0	0	0	0	0	0	0	0	0	1003	0	0	0	0	0	0	0	0	0	10	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	768	0	0	0	0	0	0	0	0	4	0	0	0
1940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154	0	0	0	0	0	0	0	4	0	0	0
2060	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	885	0	0	0	0	0	0	21	0	0	0
2220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	168	0	0	0	0	0	4	0	0	0
2280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	814	0	0	0	0	167	0	0	0
2403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	837	0	0	0	148	0	0	0
2462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	277	0	0	12	0	0	0
2522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999	0	44	0	0	0
2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	487	11	0	0	0
2583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1924	0	0	0
2585	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	466	0	0
2705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	118	0	432	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes des f1-score pour les ensembles d'entraînement et de test - NAIVE BAYES
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Moyenne f1-score train
Moyenne f1-score test
Livres anciens / occasion
Jeux vidéos anciens, équipement
Accessoires & produits dérivés gaming
Consoles de jeu
Figurines
Cartes de jeu
Figurines & Jeux de Société
Jeux & jouets pour enfants
Jeux de société
Modélisme
Vêtements bébé et jeux pour la maison
Jeux & jouets d'extérieur pour enfants
Jouets & accessoires pour bébé
Meubles d'intérieur
Linge de maison
Alimentation & vaisselle
Objets décoration maison
Equipement pour animaux
Journaux, revues, magazines anciens
Livres, BD, magazines anciens
Consoles, jeux et équipement occasion
Papeterie
Meubles d'extérieur
Equipement pour piscine
Outillage intérieur / extérieur, tâches ménagères
Livres neufs
Jeux PC



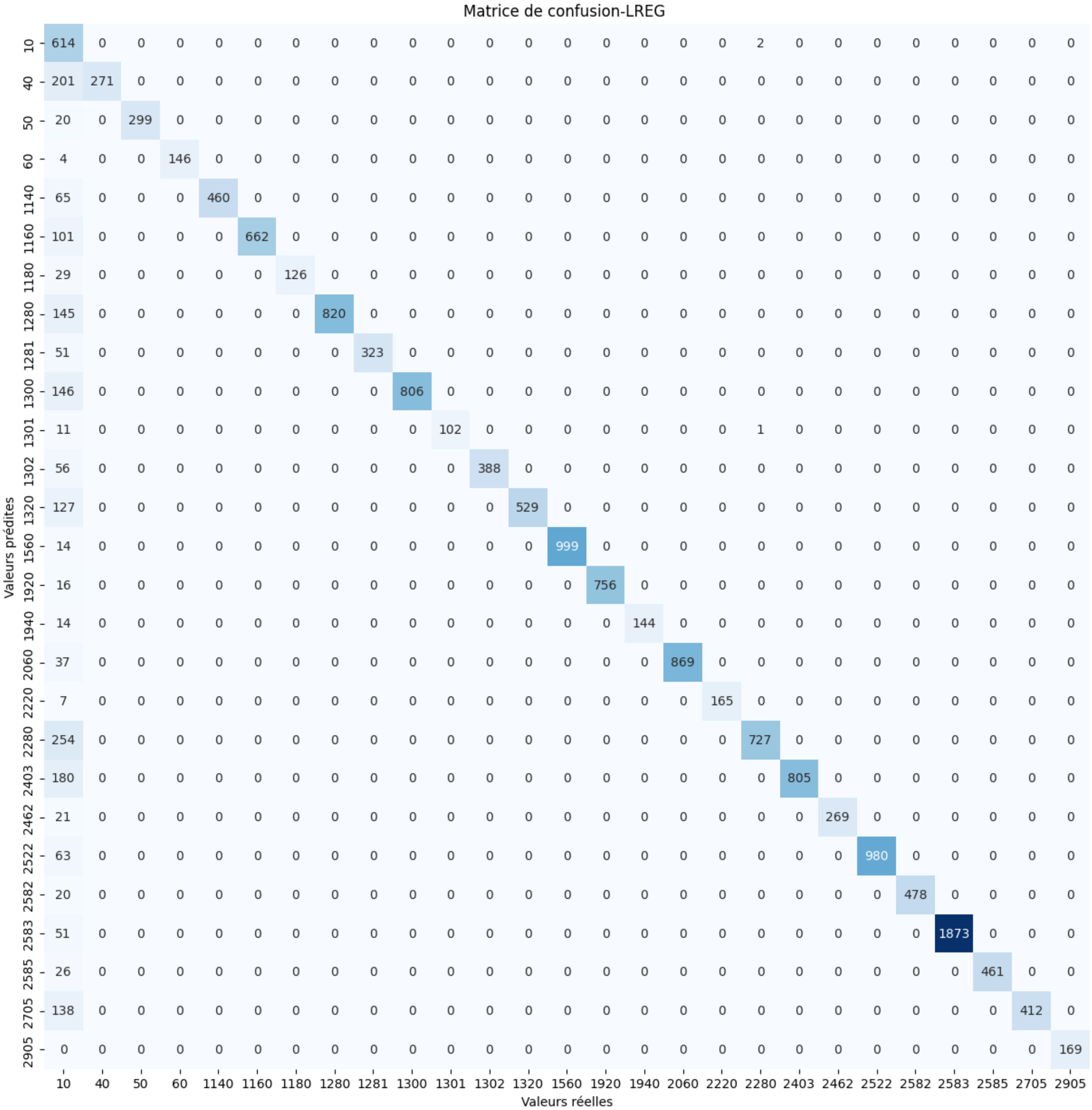
LREG (300 WORDS BY CODE)

ESTIMATOR LOGISTICREGRESSION()

PARAMS {'C': [50]}

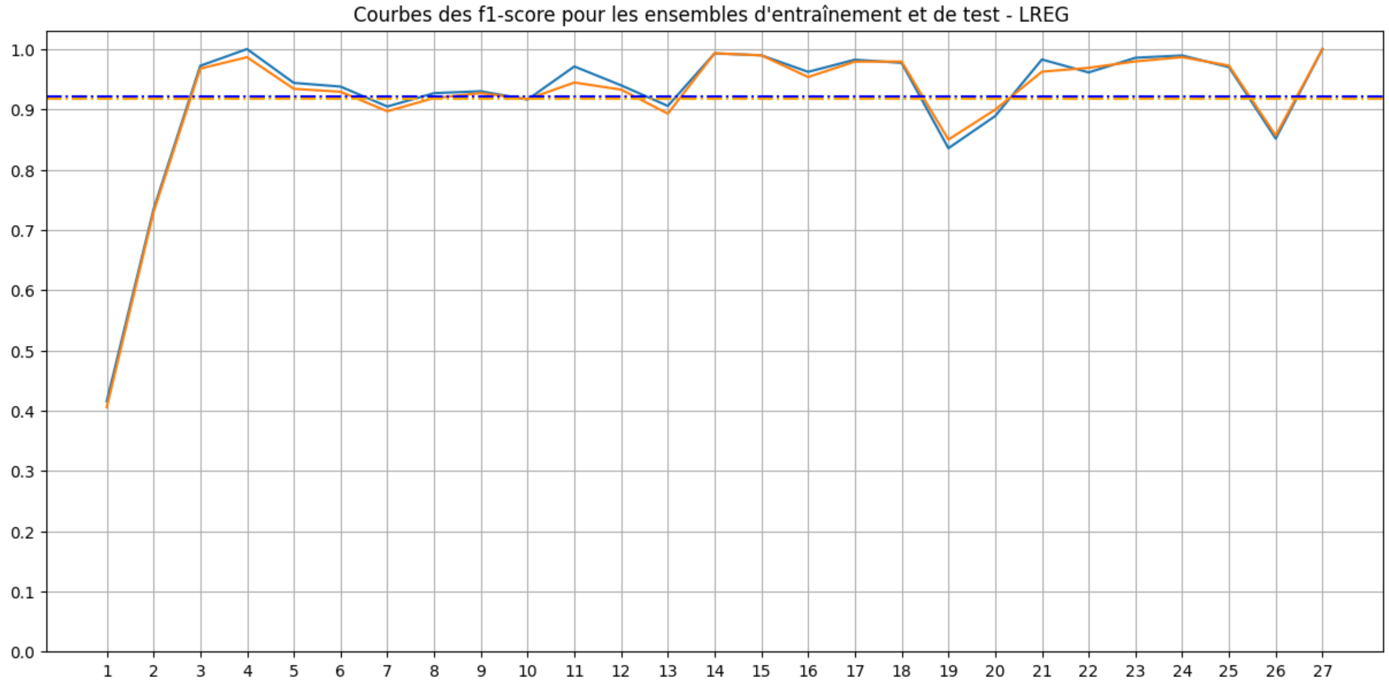
TRAIN_R2_SCORE = 0.8932109645657327

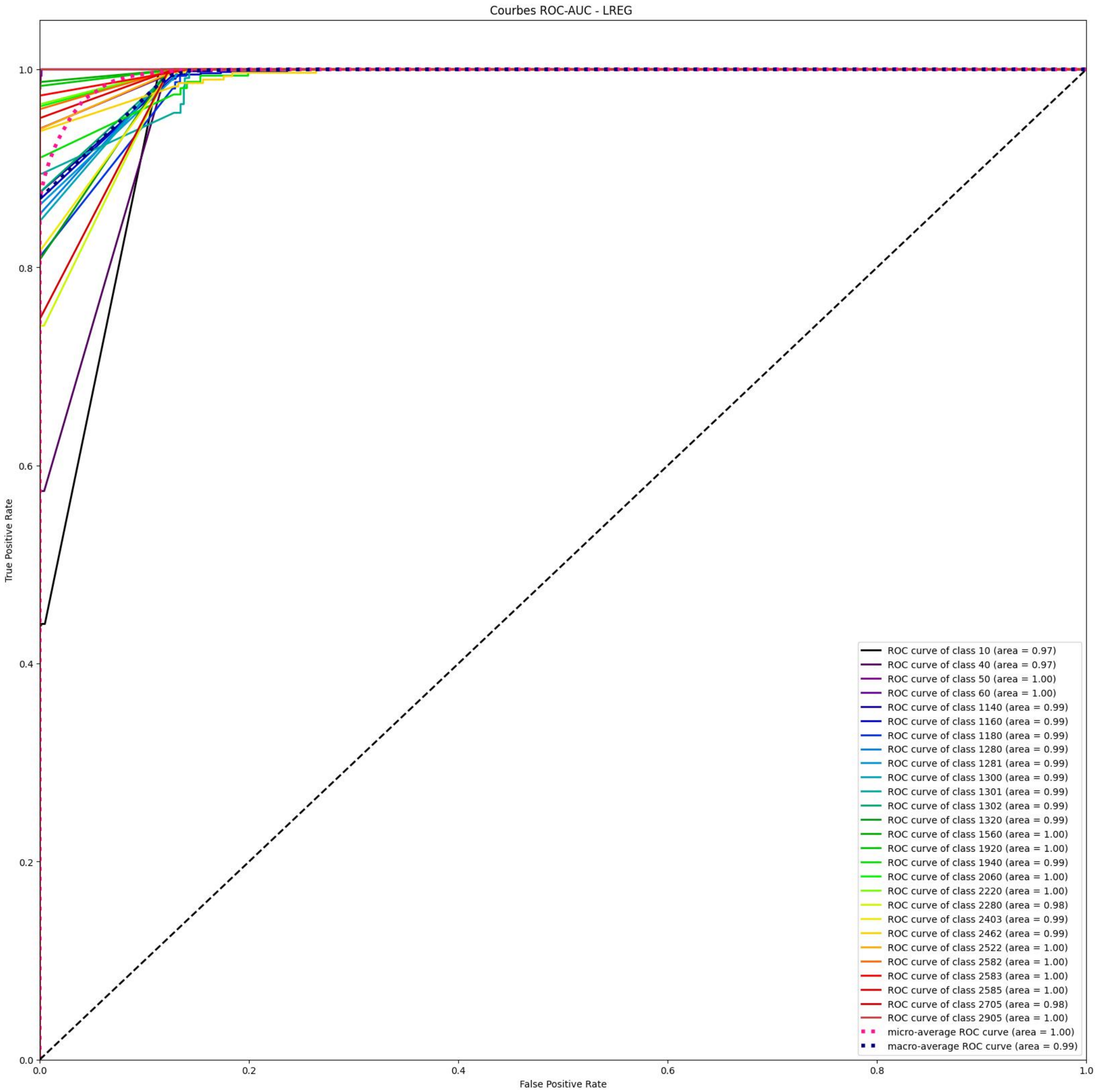
TEST_R2_SCORE = 0.8905974594298912



Matrice de confusion-LREG

	10	40	50	60	1140	1160	1180	1280	1281	1300	1301	1302	1320	1560	1920	1940	2060	2220	2280	2403	2462	2522	2582	2583	2585	2705	2905
10	614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
40	201	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	20	0	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4	0	0	146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1140	65	0	0	0	460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1160	101	0	0	0	0	662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1180	29	0	0	0	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1280	145	0	0	0	0	0	0	820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1281	51	0	0	0	0	0	0	0	323	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	146	0	0	0	0	0	0	0	0	806	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	11	0	0	0	0	0	0	0	0	0	102	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1302	56	0	0	0	0	0	0	0	0	0	0	388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1320	127	0	0	0	0	0	0	0	0	0	0	0	529	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1560	14	0	0	0	0	0	0	0	0	0	0	0	0	999	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	16	0	0	0	0	0	0	0	0	0	0	0	0	0	756	0	0	0	0	0	0	0	0	0	0	0	0
1940	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	0	0	0	0	0	0	0	0	0	0	0
2060	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	869	0	0	0	0	0	0	0	0	0	0
2220	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	165	0	0	0	0	0	0	0	0	0
2280	254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	727	0	0	0	0	0	0	0	0
2403	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	805	0	0	0	0	0	0	0
2462	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	269	0	0	0	0	0	0
2522	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	980	0	0	0	0	0
2582	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	478	0	0	0	0
2583	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1873	0	0	0
2585	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	461	0	0
2705	138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	412	0
2905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169


Courbes des f1-score pour les ensembles d'entraînement et de test - LREG
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27



```
{'mean_fit_time': array([108.86818051]),
 'std_fit_time': array([3.84594668]),
 'mean_score_time': array([0.80805755]),
 'std_score_time': array([0.09732477]),
 'param_C': masked_array(data=[50],
          mask=[False],
      fill_value='?',
         dtype=object),
 'params': [{'C': 50}],
 'split0_test_score': array([0.88809372]),
 'split1_test_score': array([0.88872681]),
'split2_test_score': array([0.88412272]),

'mean_test_score': array([0.88698108]),

'std_test_score': array([0.00203763]),

'rank_test_score': array([1])}
```