UNIVERSIDAD
NACIONAL
DE COLOMBIA

U.N. Sede Medellín

Facultad de Minas, Trabajo y Rectitud

Detección y pronóstico de Incendios forestales- Métodos supervisados

Curso Machine Learning

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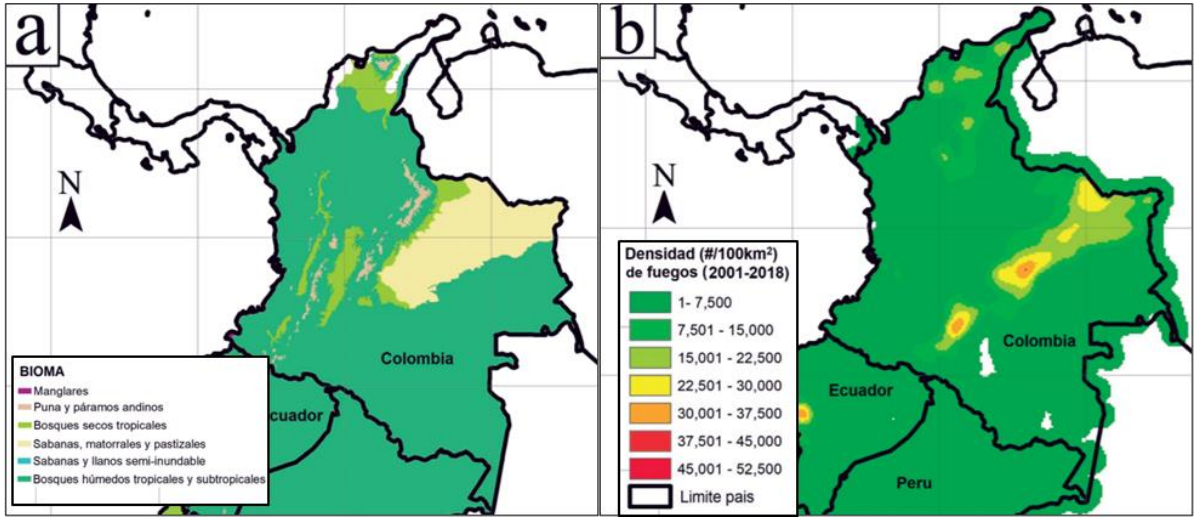
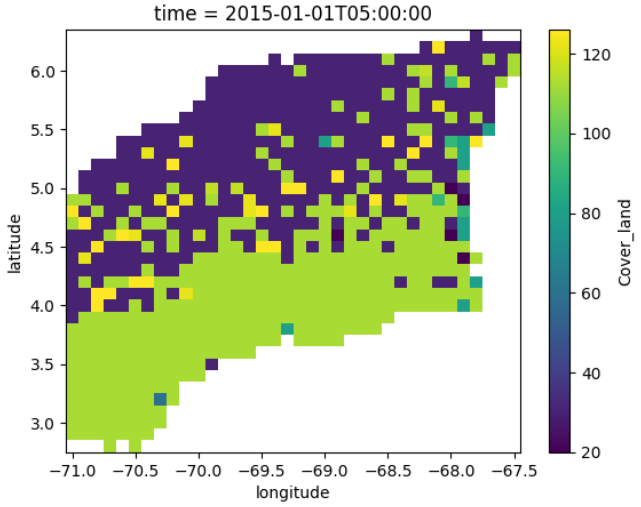
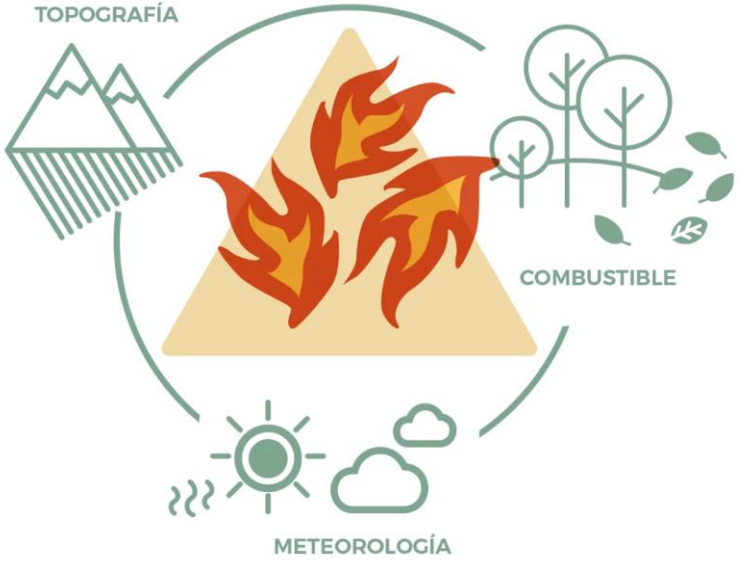
Introducción





Variables Independientes



Topografía

- Pendiente (slope)

ASF

Meteorología

- Temperatura (2mT, soilT, skinT)
- Humedad (soilH)
- Precipitación (pre)
- Evaporación (ev)
- Radiación (rad)

Climate Change Service

Combustible

- Coberturas (cover)

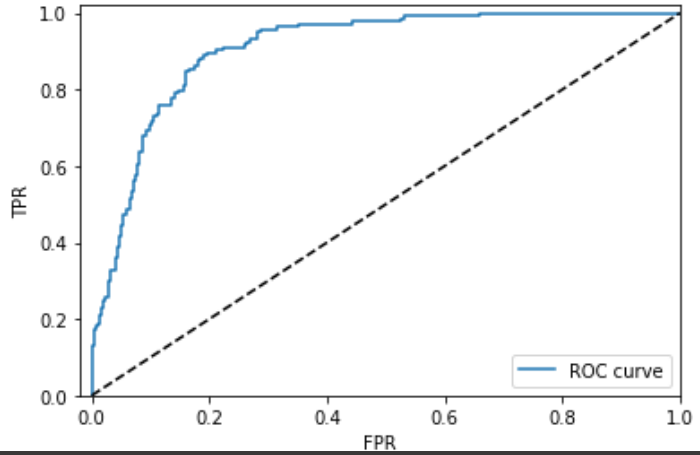
Copernicus
Europe's eyes on Earth

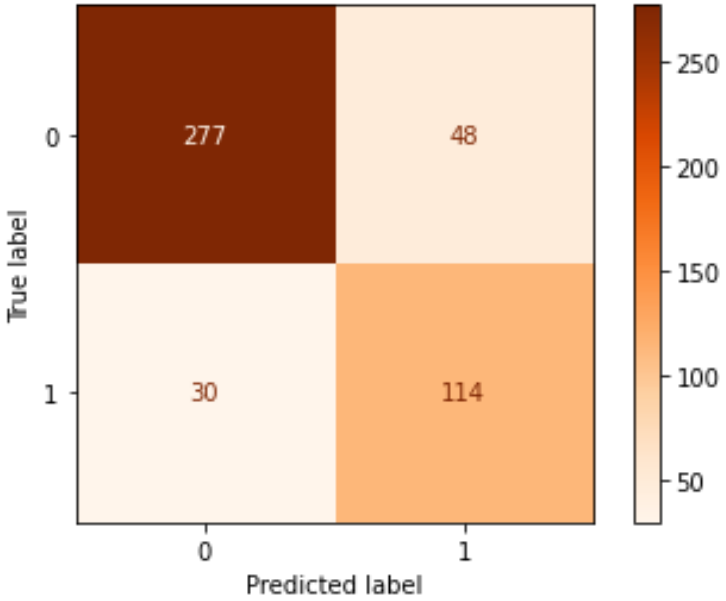
Modelos Supervisados

Análisis Discriminante Lineal

Accuracy de LDA para validación: 0.83

	precision	recall	f1-score	support
0	0.90	0.85	0.88	325
1	0.70	0.79	0.75	144
accuracy			0.83	469
macro avg	0.80	0.82	0.81	469
weighted avg	0.84	0.83	0.84	469



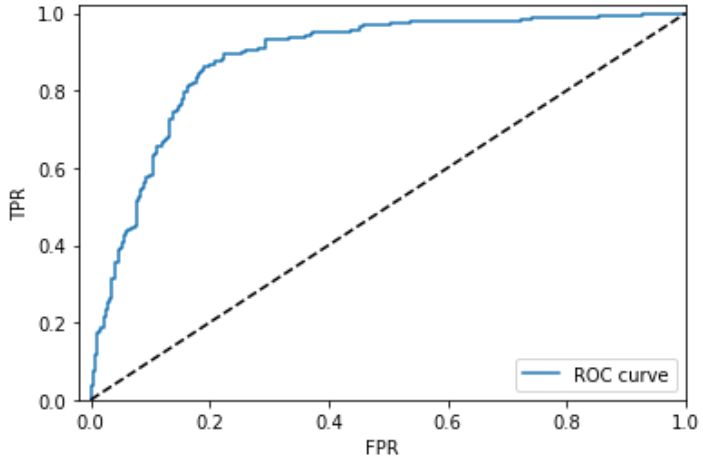


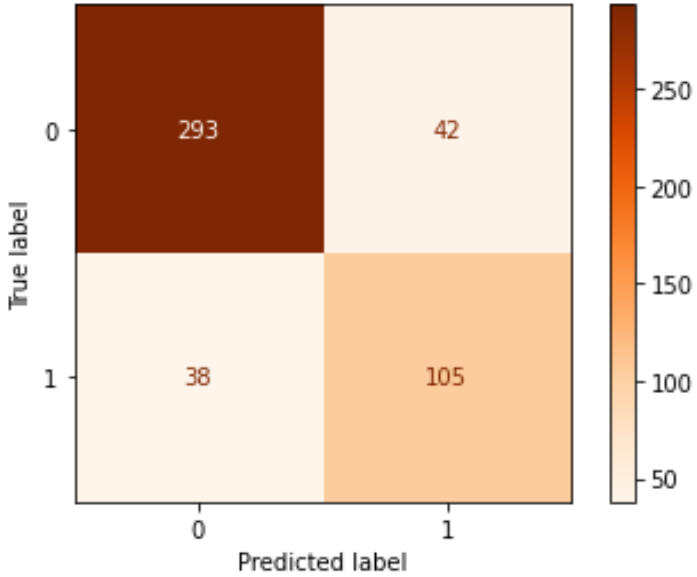
n_components=1

Regresión Logística

Precision en validacion: 0.8326359832635983

	precision	recall	f1-score	support
0	0.89	0.87	0.88	335
1	0.71	0.73	0.72	143
accuracy			0.83	478
macro avg	0.80	0.80	0.80	478
weighted avg	0.83	0.83	0.83	478



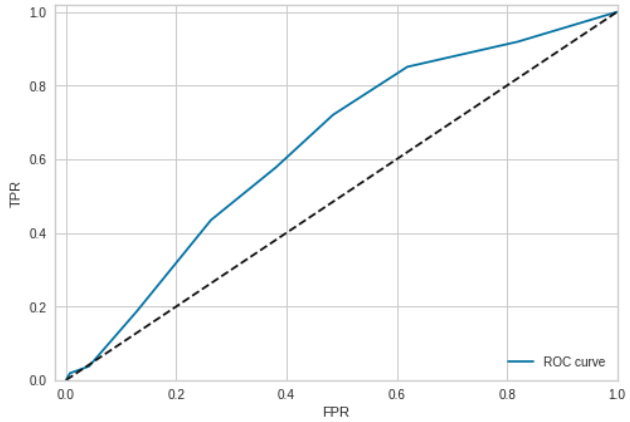


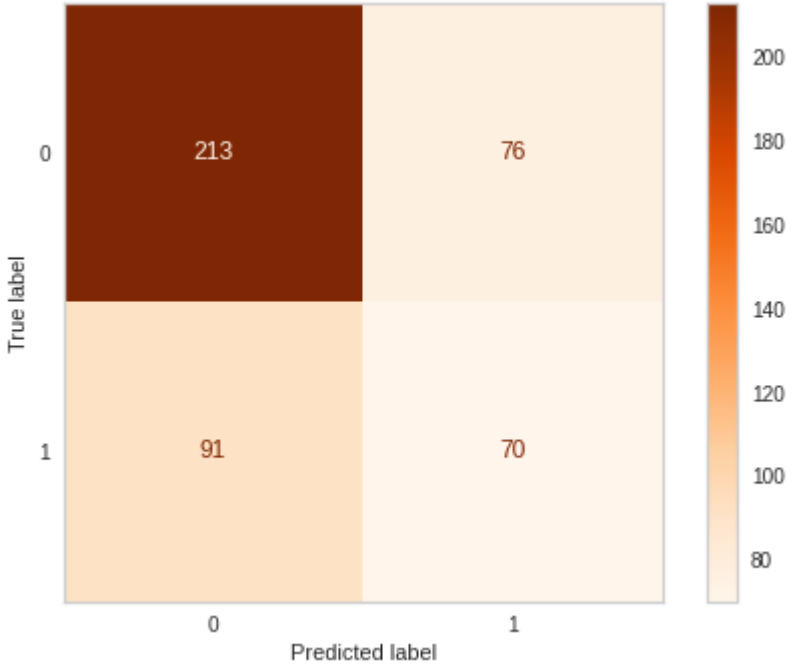
penalty=L1

solver='liblinear'

KNN (K-nearest neighbors)

	precision	recall	f1-score	support
0	0.70	0.74	0.72	289
1	0.48	0.43	0.46	161
accuracy			0.63	450
macro avg	0.59	0.59	0.59	450
weighted avg	0.62	0.63	0.62	450

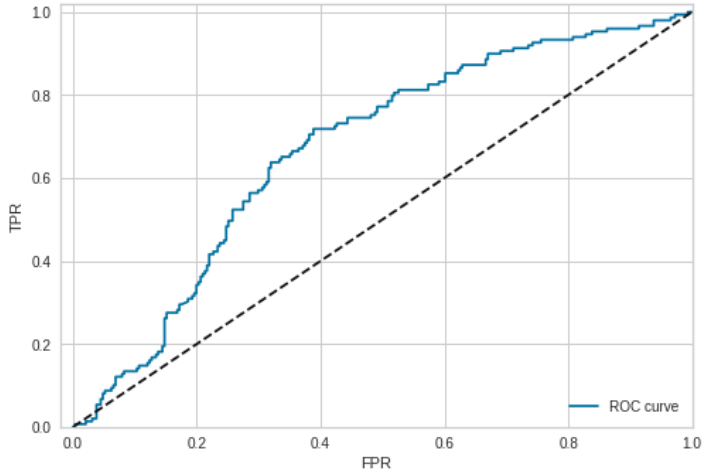


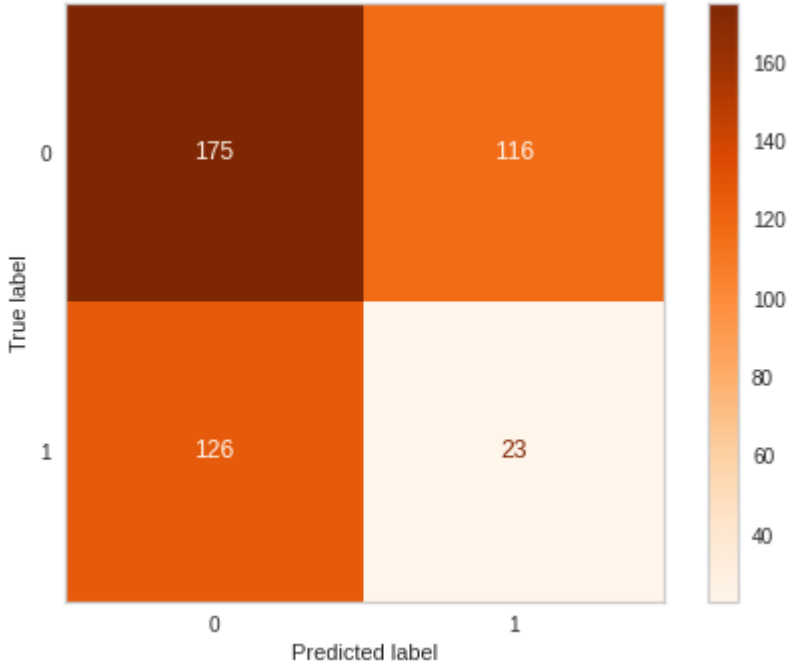


n_neighbors=9

Support Vector Machine

	precision	recall	f1-score	support
0	0.58	0.60	0.59	291
1	0.17	0.15	0.16	149
accuracy			0.45	440
macro avg	0.37	0.38	0.38	440
weighted avg	0.44	0.45	0.45	440

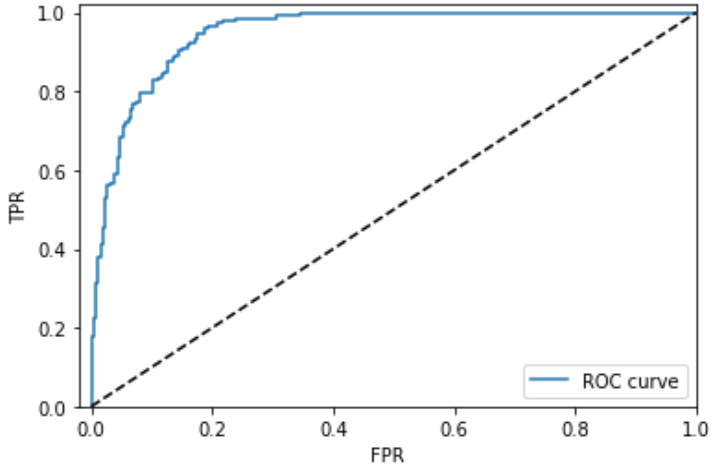


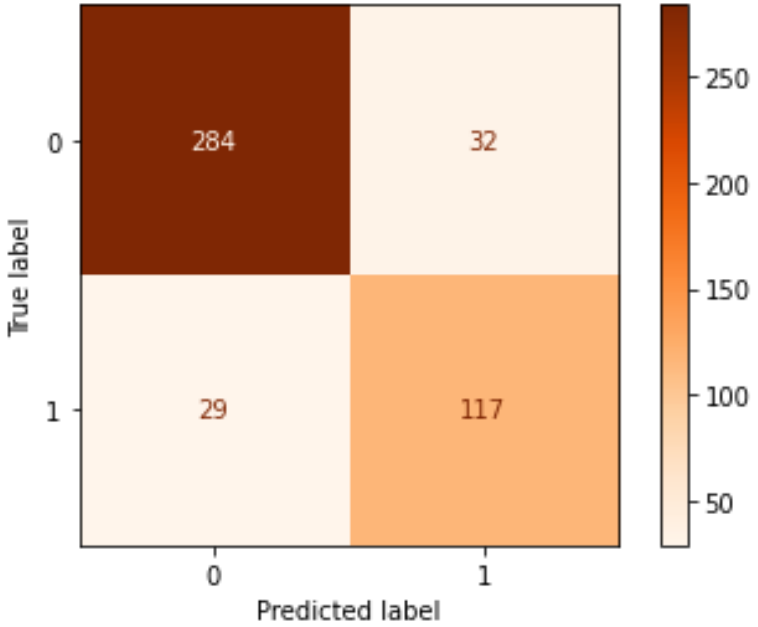


`kernel='sigmoid'`

Redes neuronales

	precision	recall	f1-score	support
0	0.91	0.90	0.90	316
1	0.79	0.80	0.79	146
accuracy			0.87	462
macro avg	0.85	0.85	0.85	462
weighted avg	0.87	0.87	0.87	462

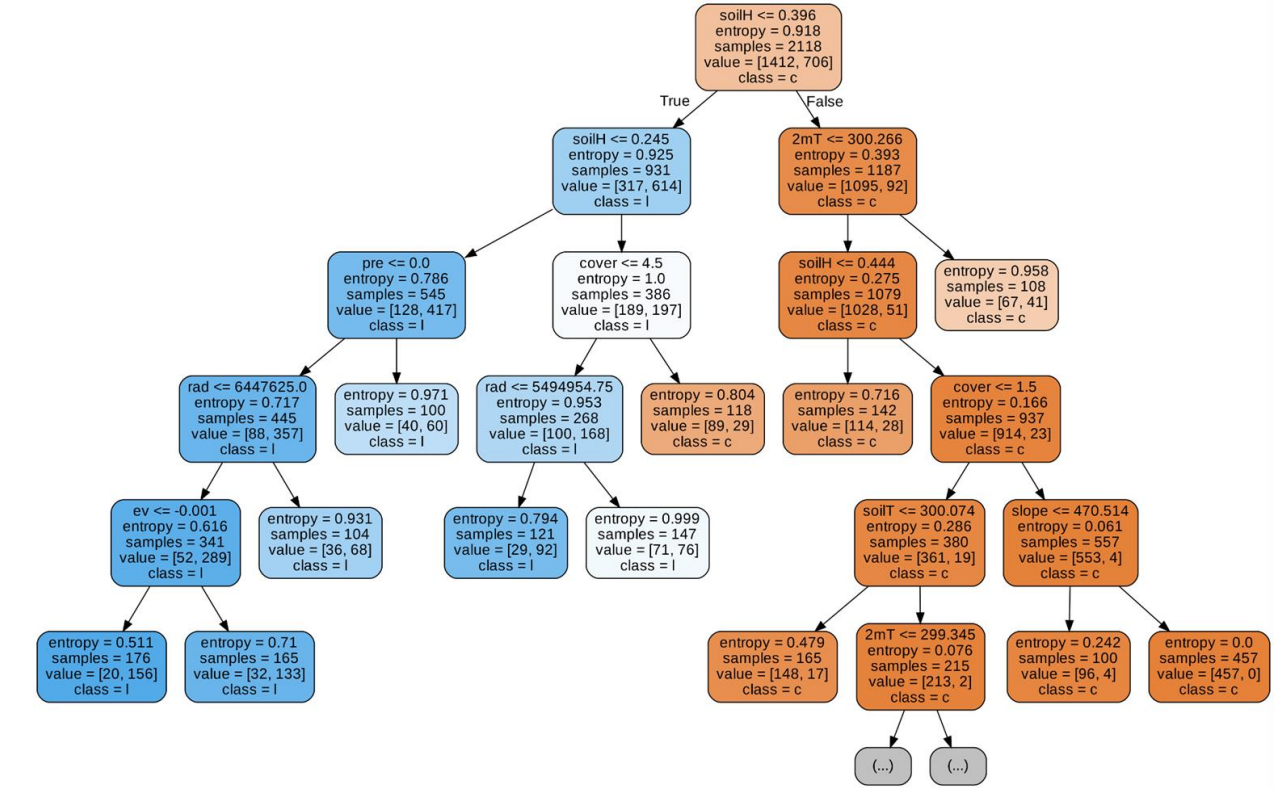





```
hidden_layer_sizes=(10,5)
```

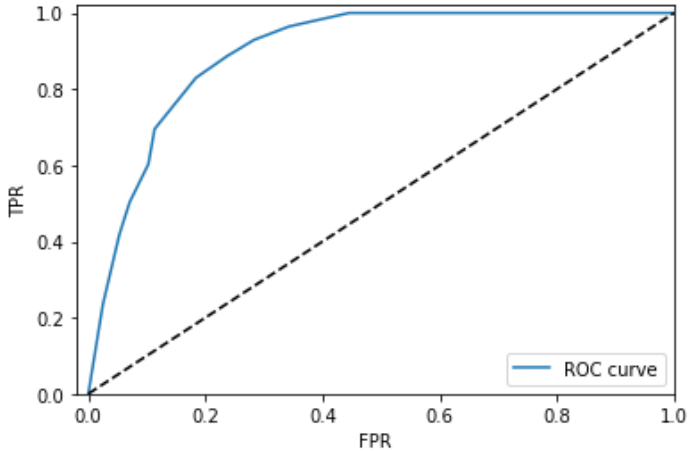
Modelos ensamblados

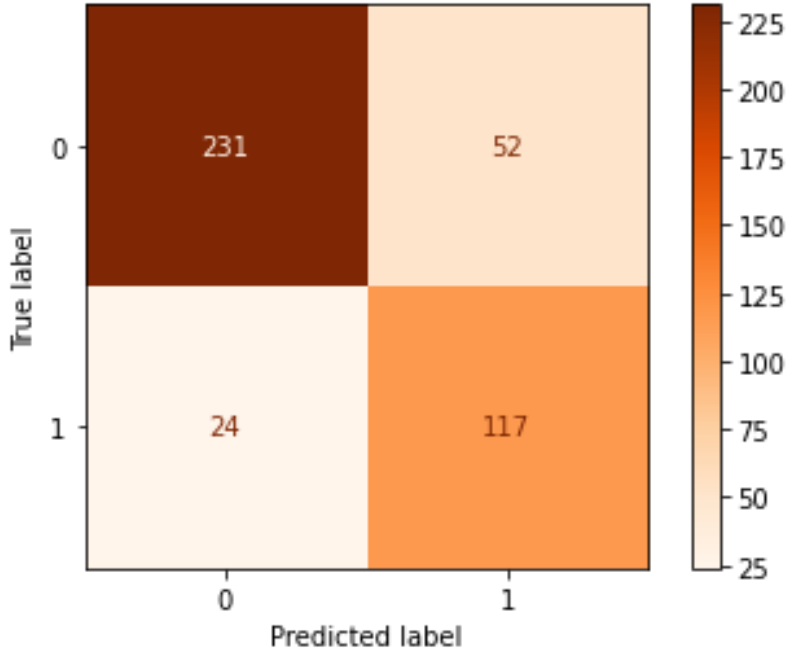
Árboles de decisión




```
min_samples_split=100,
min_samples_leaf=100
criterion='entropy'
```

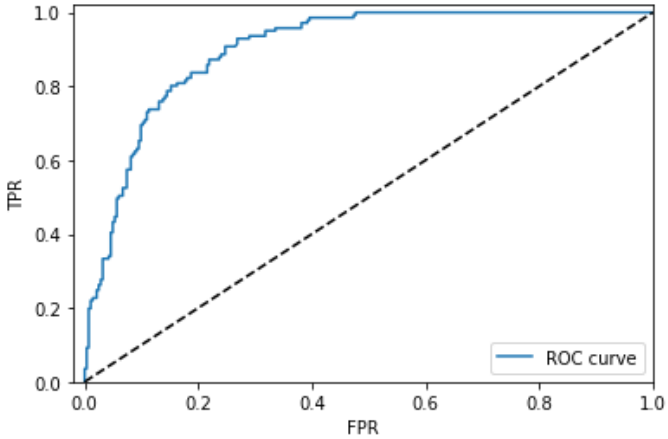
	precision	recall	f1-score	support
0	0.91	0.82	0.86	283
1	0.69	0.83	0.75	141
accuracy			0.82	424
macro avg	0.80	0.82	0.81	424
weighted avg	0.83	0.82	0.82	424

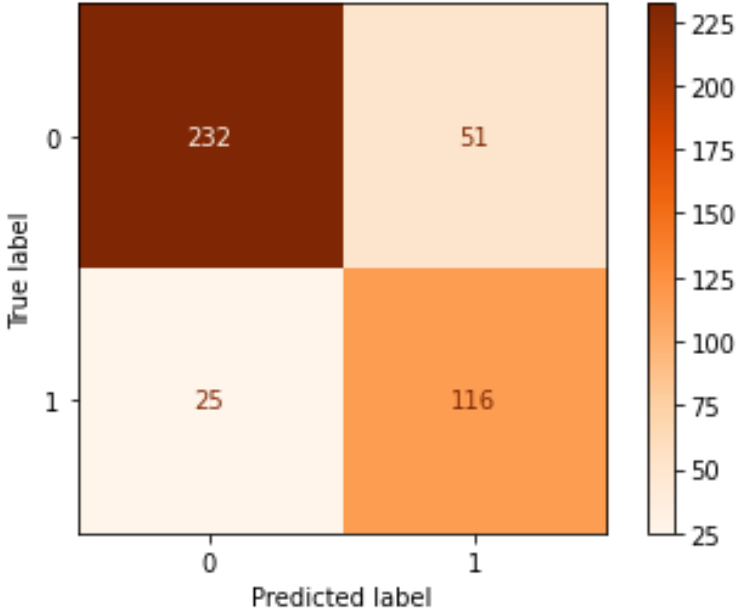




BagginClassifier para Arbol de decision

	precision	recall	f1-score	support
0	0.90	0.82	0.86	283
1	0.69	0.82	0.75	141
accuracy			0.82	424
macro avg	0.80	0.82	0.81	424
weighted avg	0.83	0.82	0.82	424

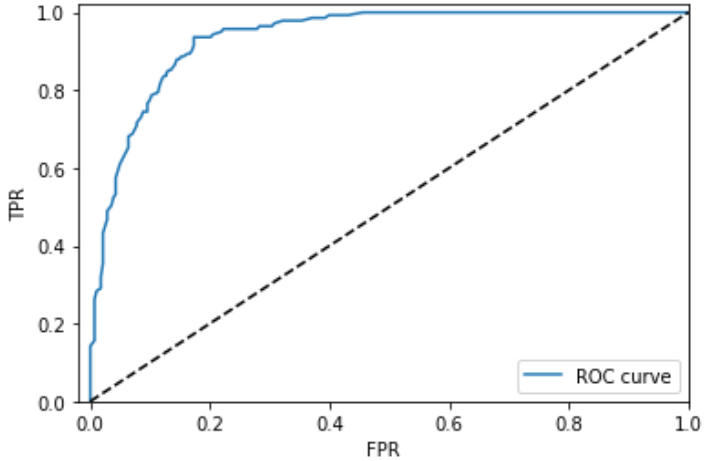


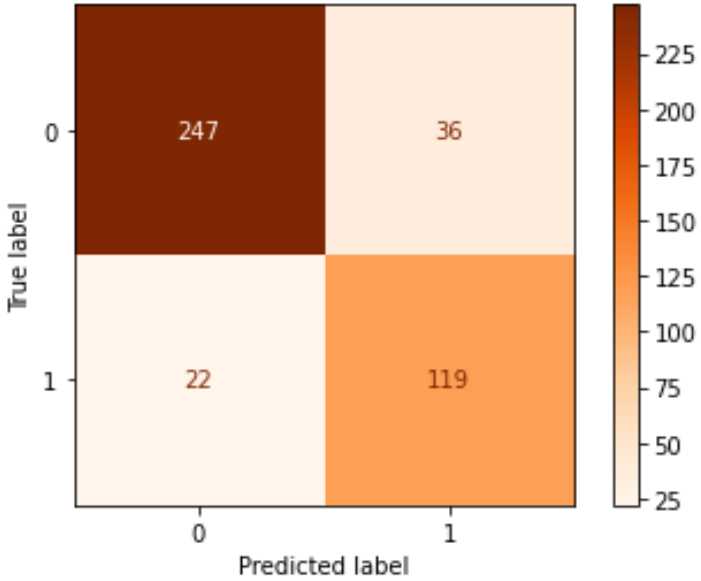


n_estimators=100

Random Forests

	precision	recall	f1-score	support
0	0.92	0.87	0.89	283
1	0.77	0.84	0.80	141
accuracy			0.86	424
macro avg	0.84	0.86	0.85	424
weighted avg	0.87	0.86	0.86	424

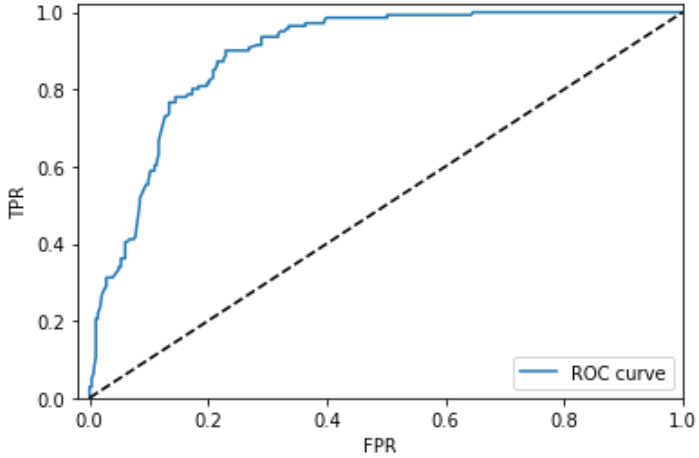


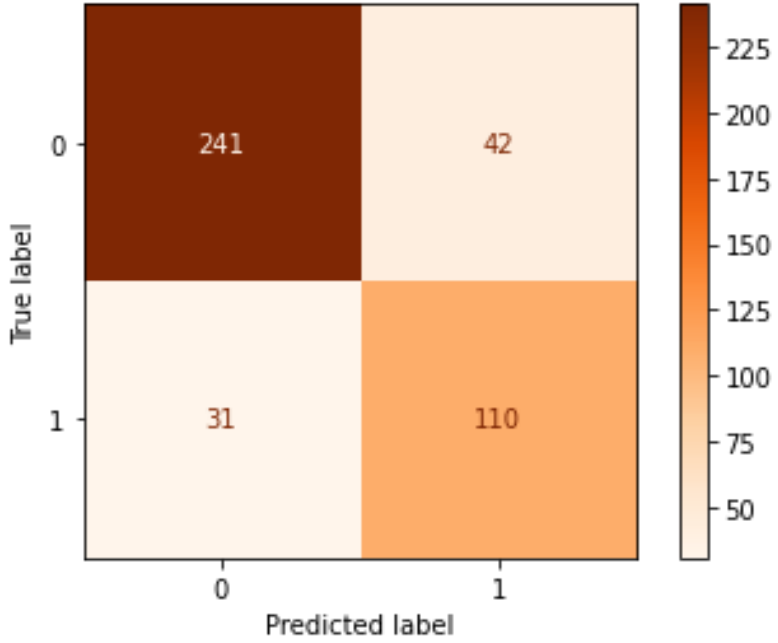


n_estimators=100

AdaBoost

	precision	recall	f1-score	support
0	0.89	0.85	0.87	283
1	0.72	0.78	0.75	141
accuracy			0.83	424
macro avg	0.80	0.82	0.81	424
weighted avg	0.83	0.83	0.83	424

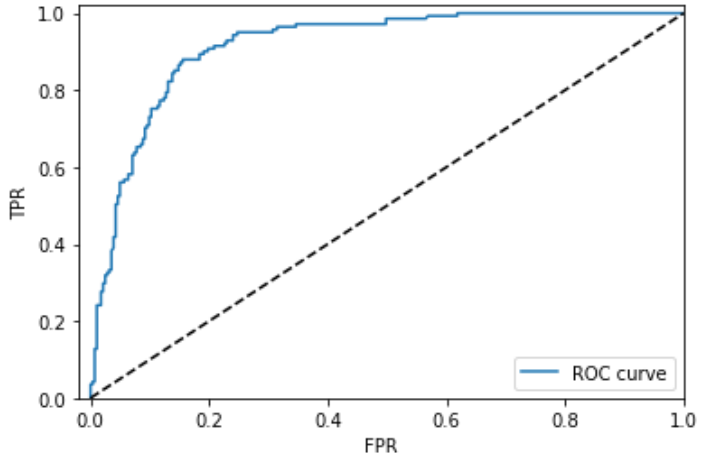


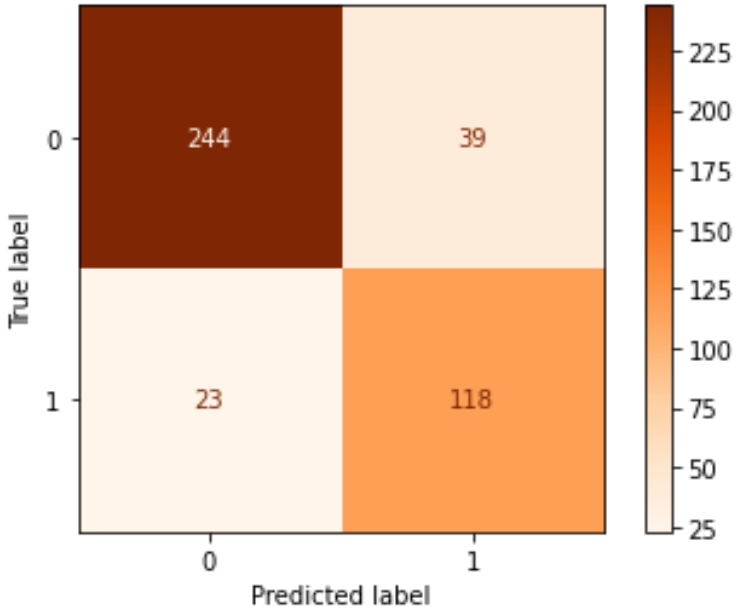


n_estimators=30

Stochastic Gradient

	precision	recall	f1-score	support
0	0.91	0.86	0.89	283
1	0.75	0.84	0.79	141
accuracy			0.85	424
macro avg	0.83	0.85	0.84	424
weighted avg	0.86	0.85	0.86	424

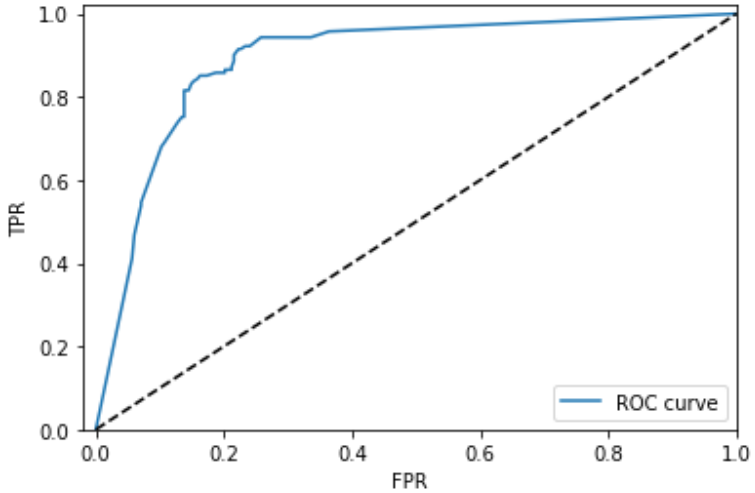


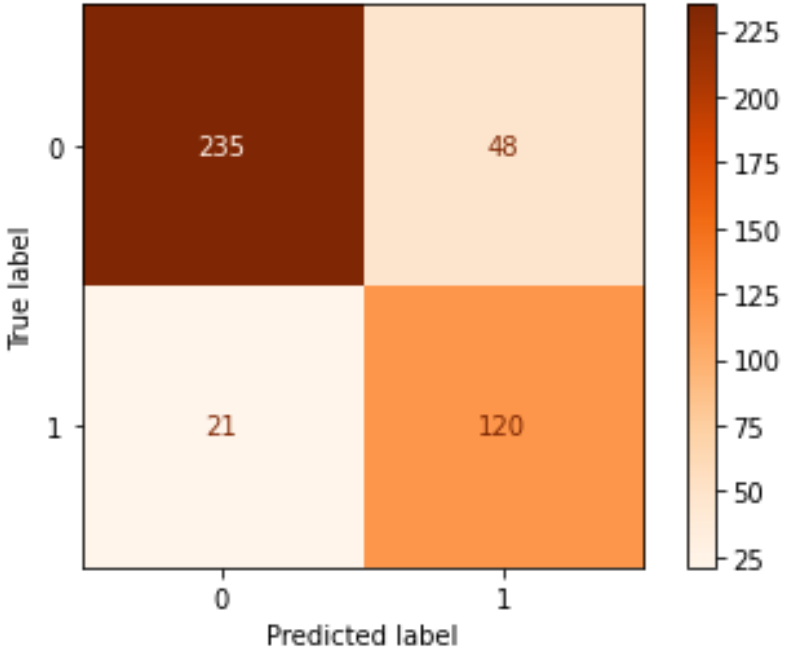


n_estimators=100

XGBoost

	precision	recall	f1-score	support
0	0.92	0.83	0.87	283
1	0.71	0.85	0.78	141
accuracy			0.84	424
macro avg	0.82	0.84	0.82	424
weighted avg	0.85	0.84	0.84	424





n_estimators=7

Gracias