SDAIA
الهيئة السعودية للبيانات والذكاء الاصطناعي
Saudi Data & AI Authority

Predicting qualified employees for promotion

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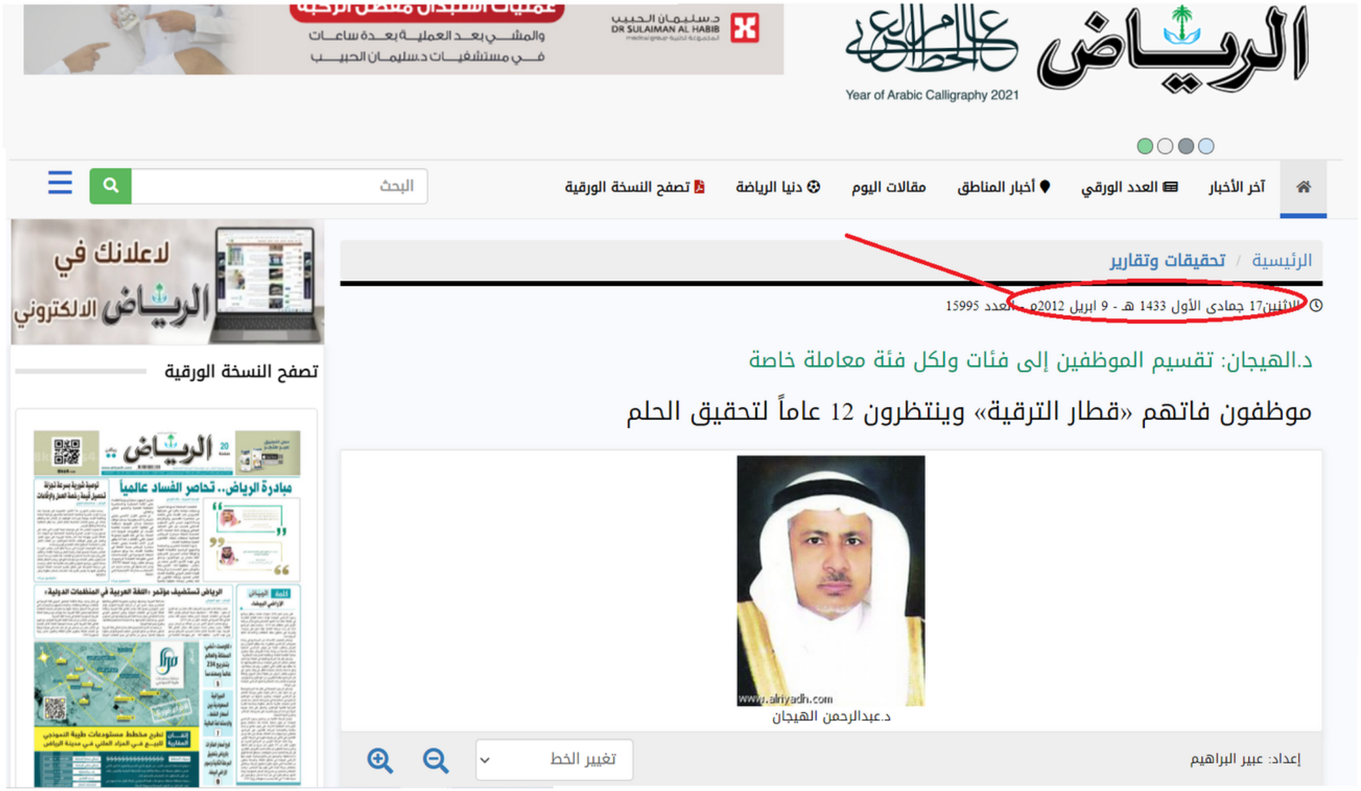
INTRODUCTION



INTRODUCTION

The goal:

Predicting employees who are qualified for promotion.

DATA STRUCTURE

Columns: 13

Rows: 54808

	employee_id	department	region	education	gender	recruitment_channel	no_of_trainings	age	previous_year_rating	length_of_service	awards_won?	avg_training_score	is_promoted
0	65438	Sales & Marketing	region_7	Master's & above	f	sourcing	1	35	5.0	8	0	49	0
1	65141	Operations	region_22	Bachelor's	m	other	1	30	5.0	4	0	60	0
2	7513	Sales & Marketing	region_19	Bachelor's	m	sourcing	1	34	3.0	7	0	50	0
3	2542	Sales & Marketing	region_23	Bachelor's	m	other	2	39	1.0	10	0	50	0
4	48945	Technology	region_26	Bachelor's	m	other	1	45	3.0	2	0	73	0

DATA CLEANING

NULLS VALUE - DUPLICATED - MANAGING COLUMNS

After Cleaning...

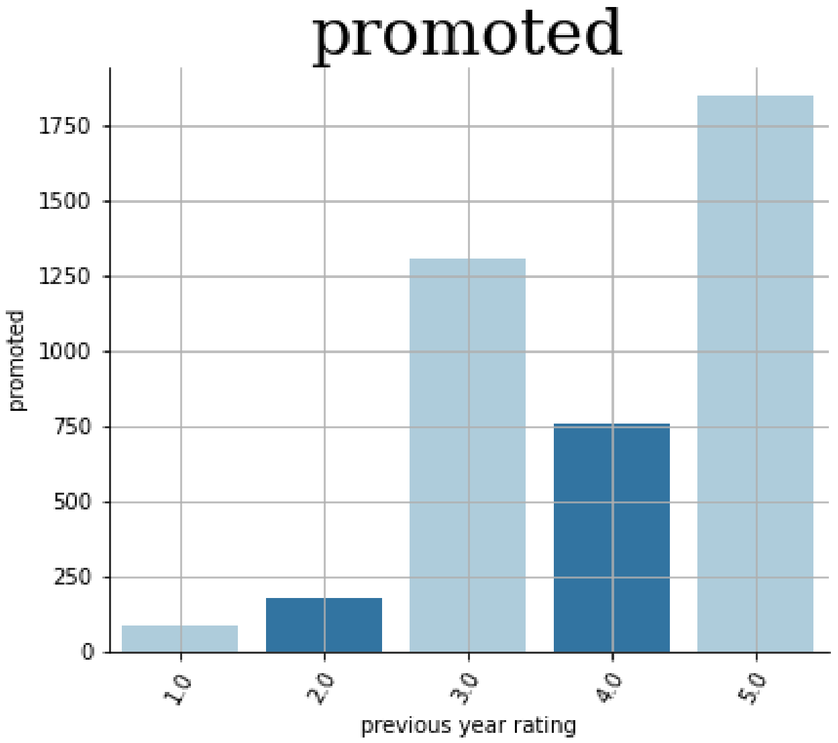
FEATURES

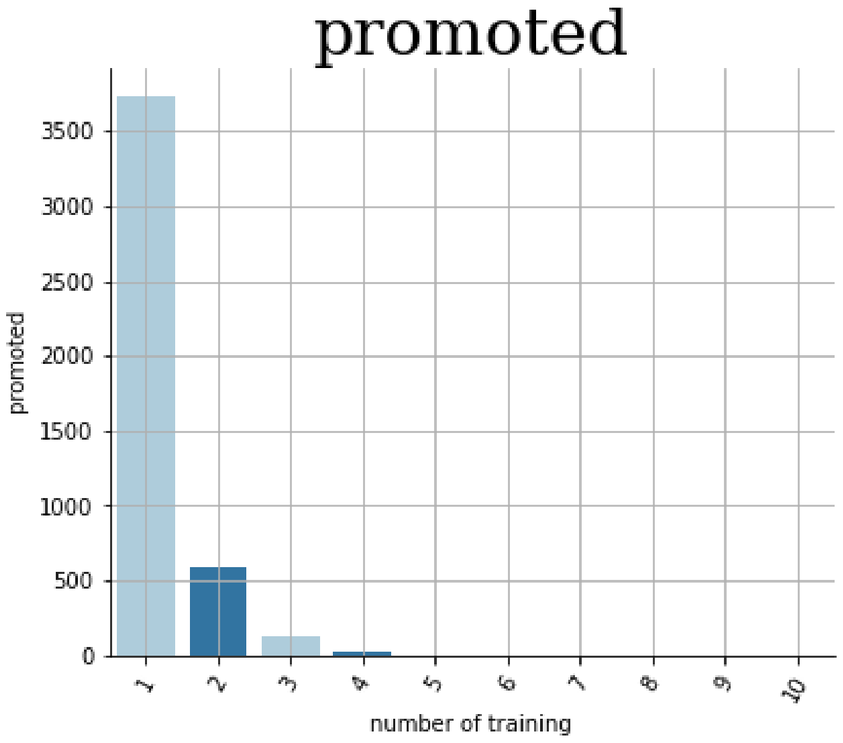
DEPARTMENT	EDUCATION	GENDER	NO OF TRAININGS	AGE
PREVIOUS YEAR RATING	LENGTH OF SERVICE	AWARDS WON	AVREGE TRAINING SCORE	

TARGET

IS PROMOTED

DATA ANALYSIS





DATA ANALYSIS

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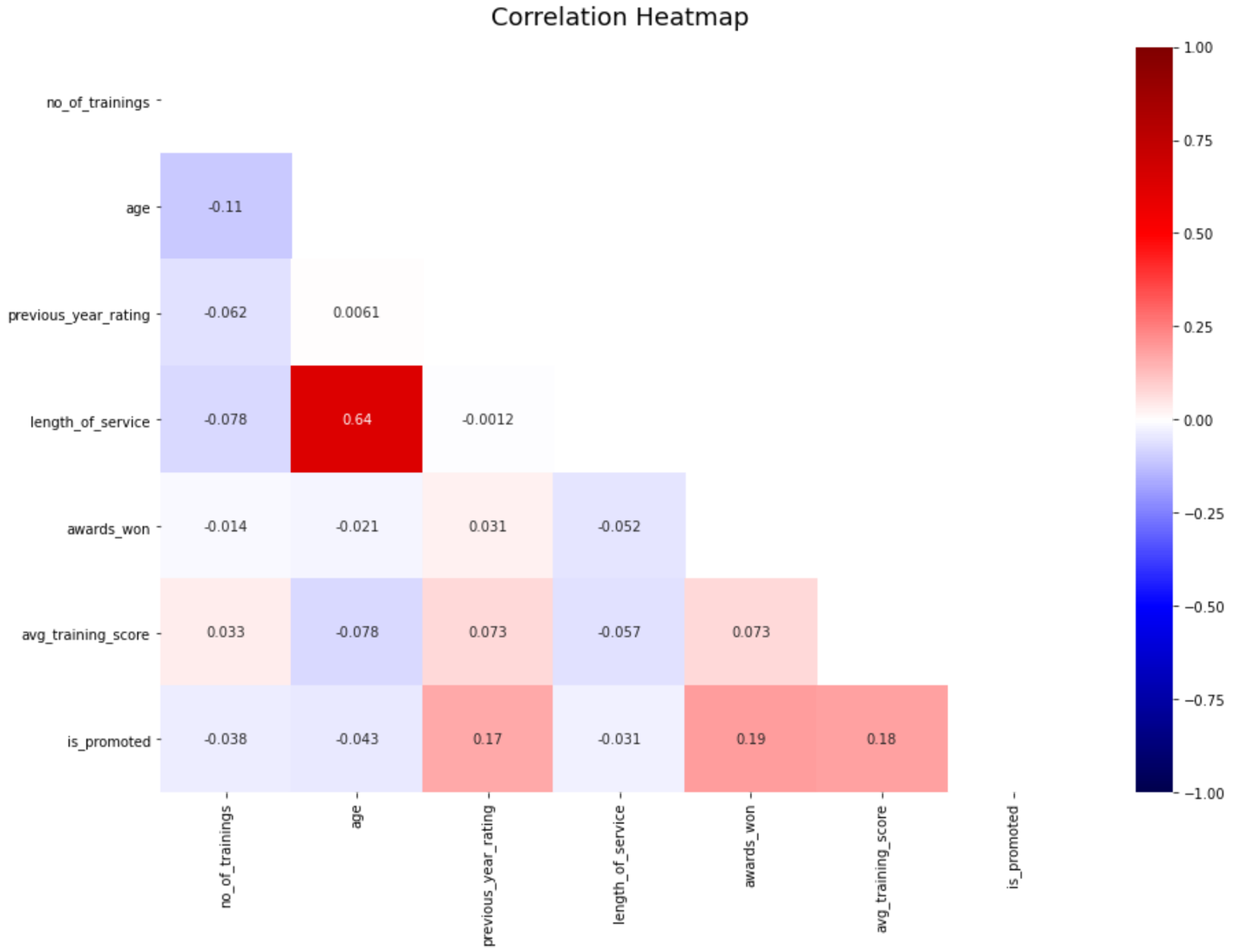
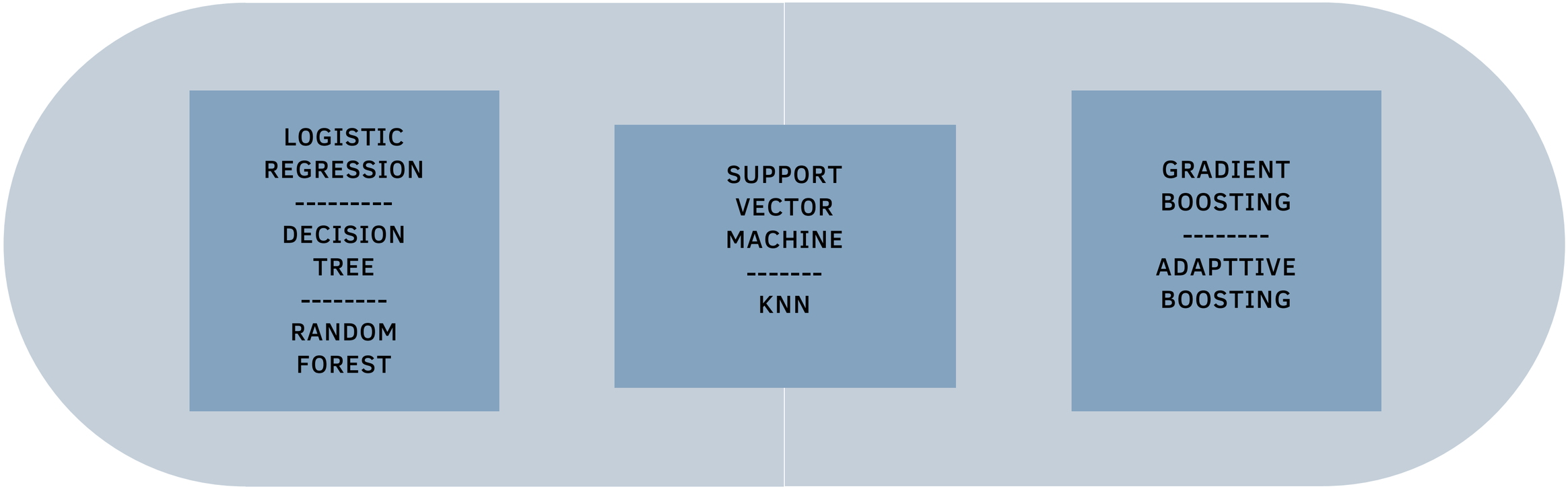


Classification Models



IMPALANCE

BEFOUR

0 - 32867
1- 3618

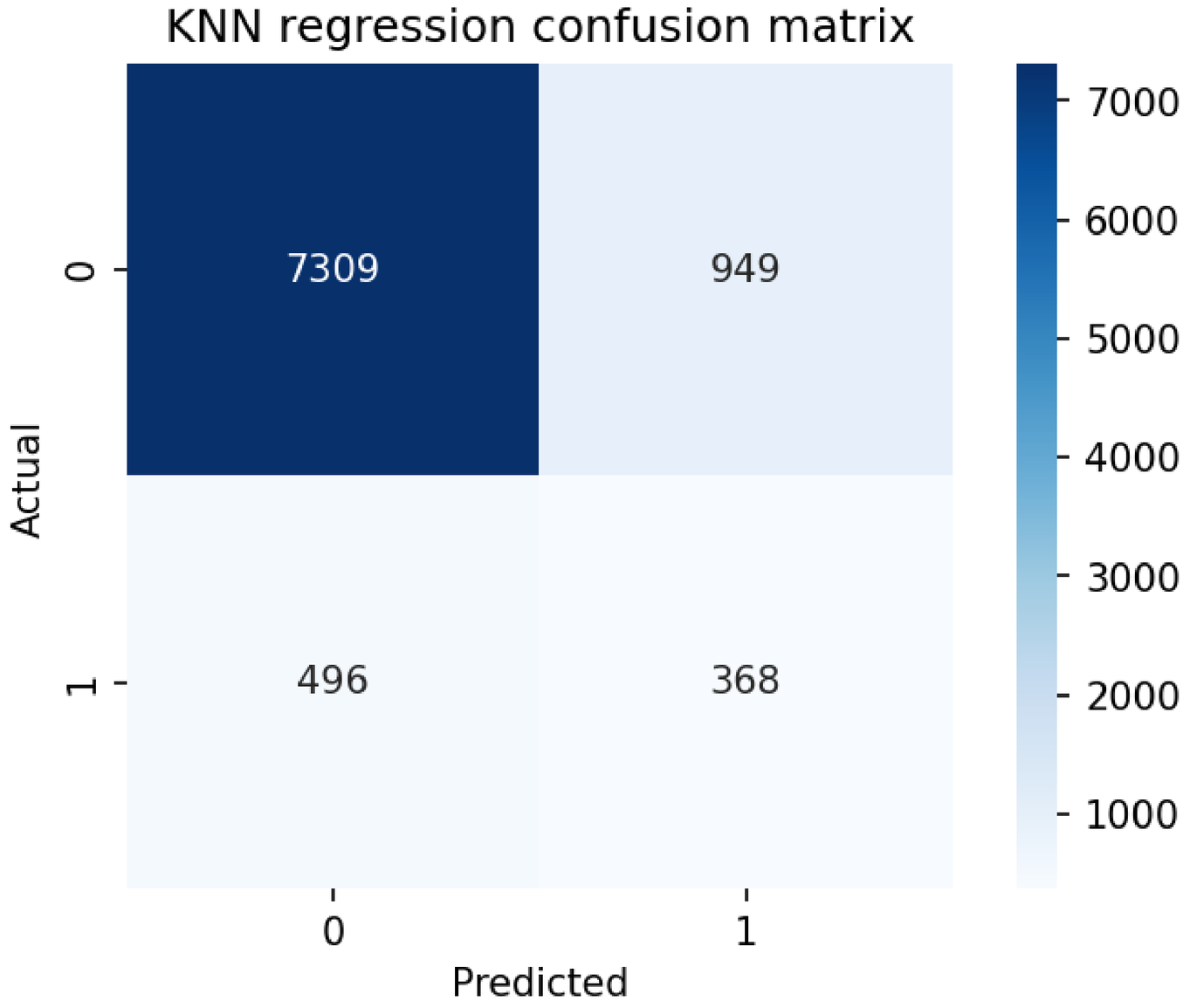
SMOTE

AFTER

0 - 32867
1- 32867

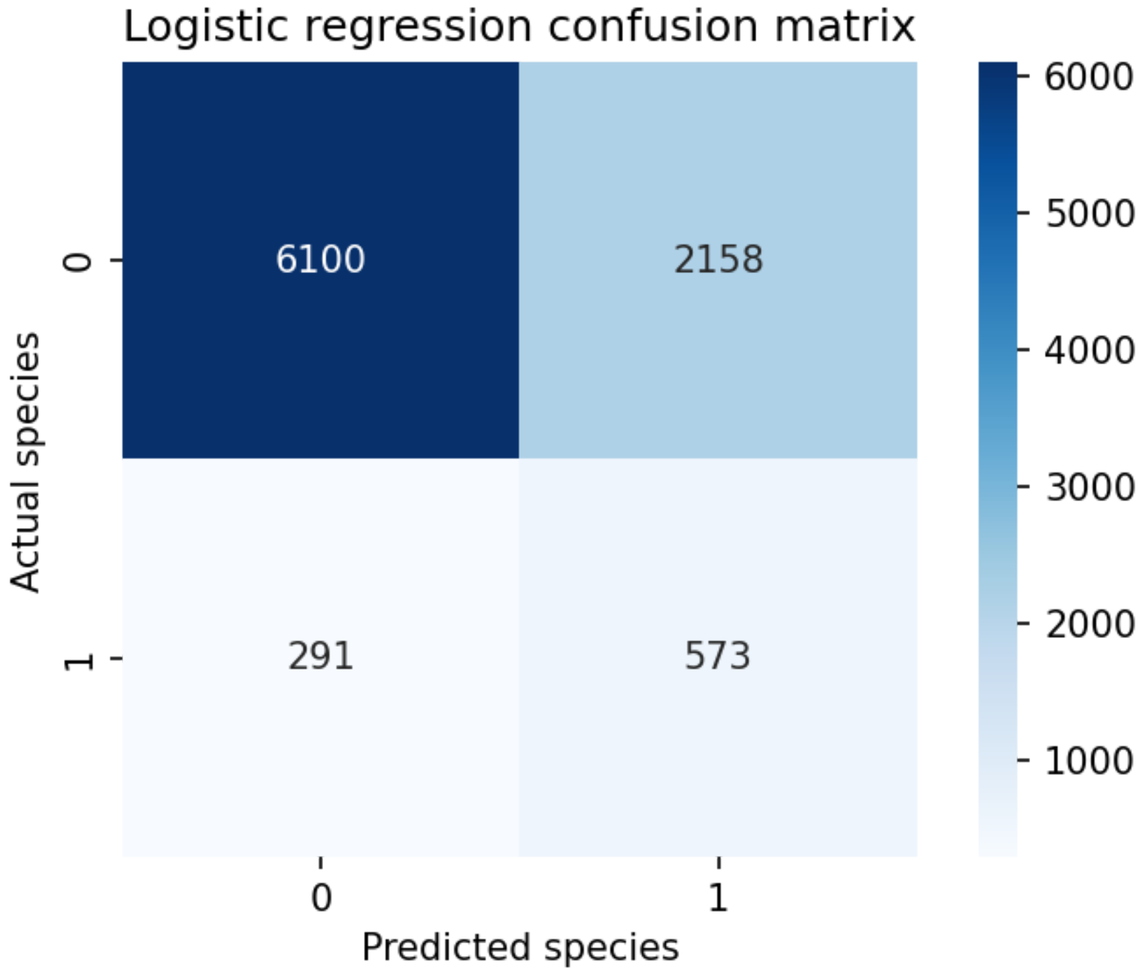
KNN

Train	90%
Test	84%



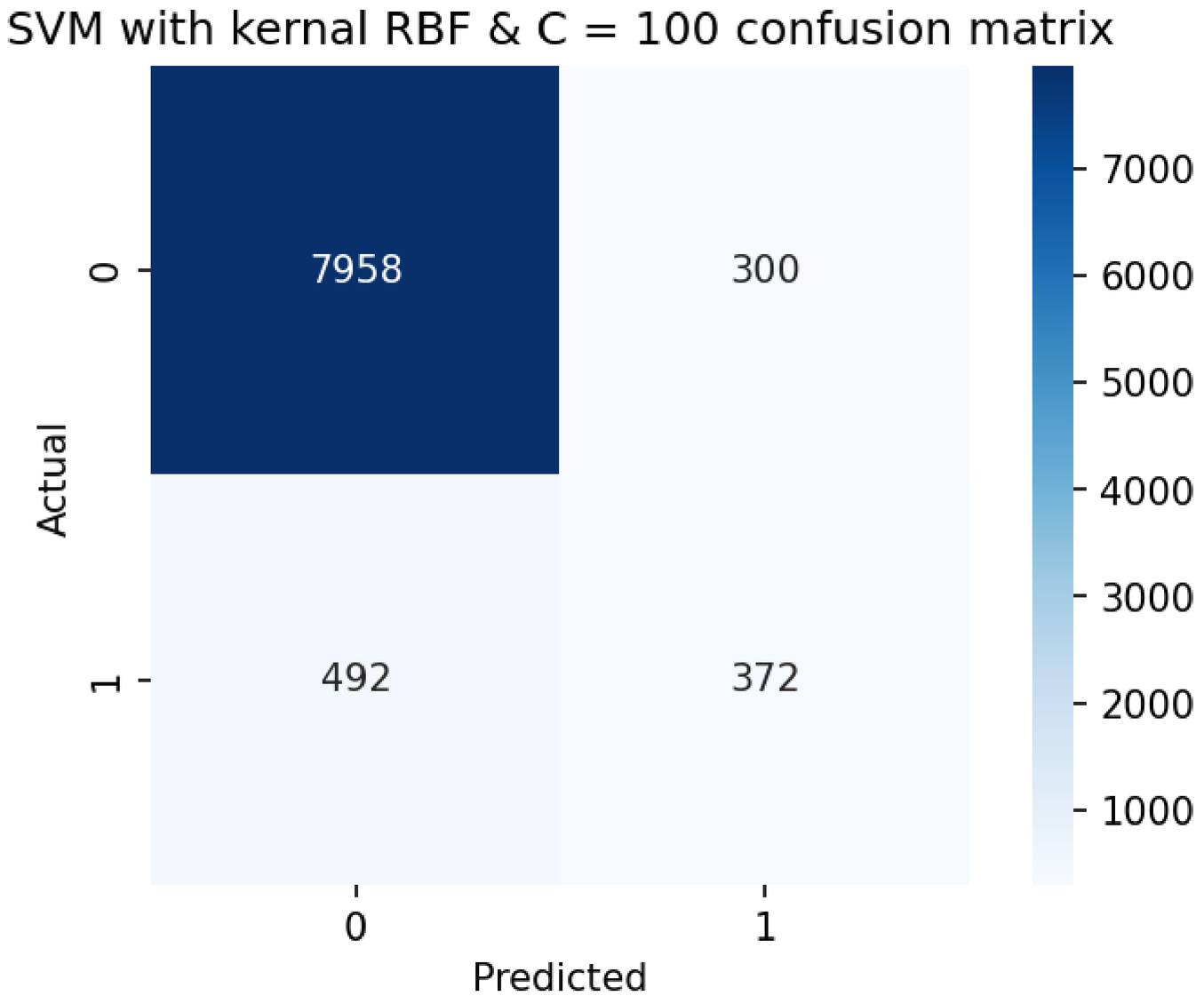
LOGISTIC REGRESSION

Train	**73%**
Test	**71%**



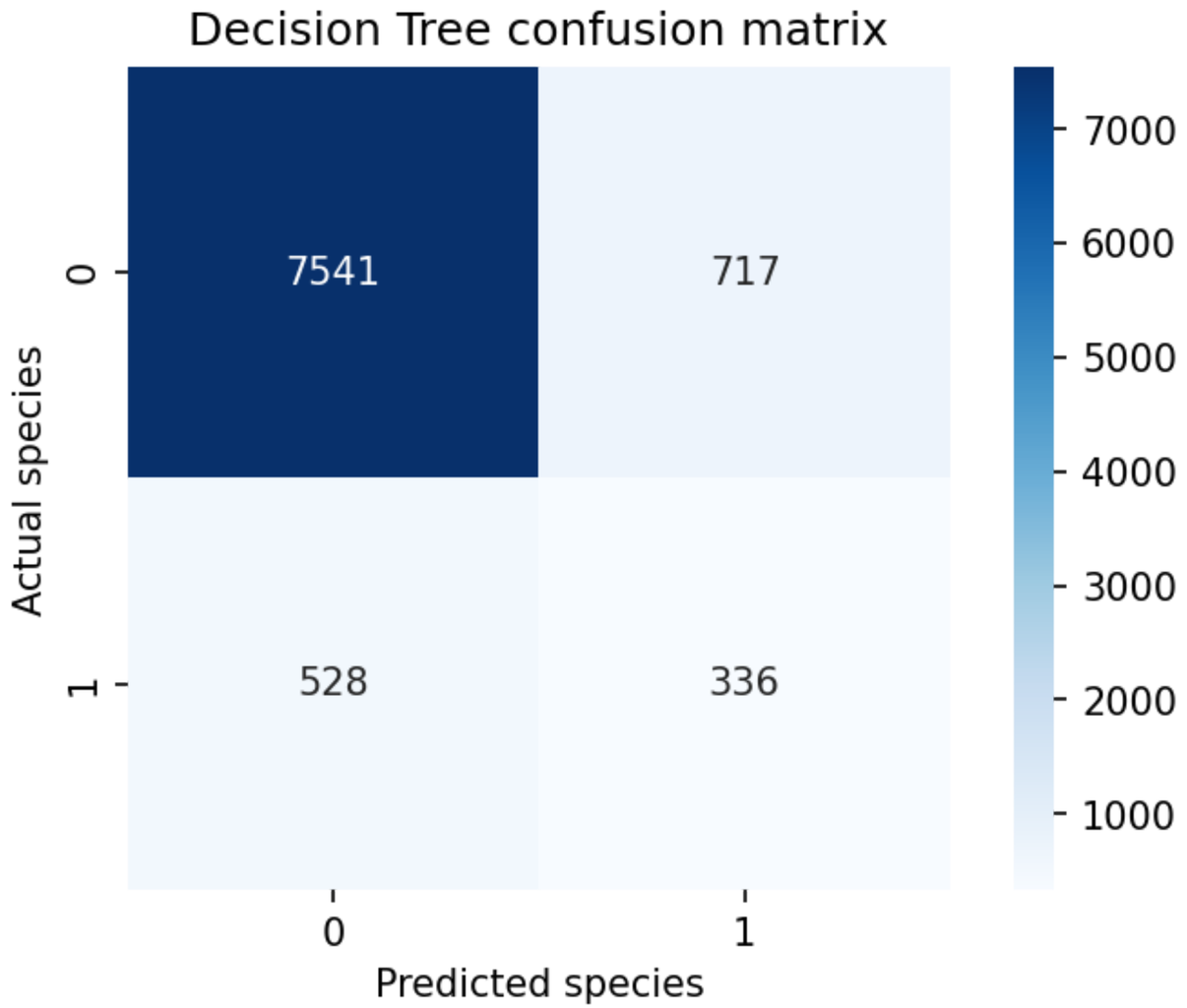
SUPPORT VECTOR MACHINE

Train	91%
Test	87%



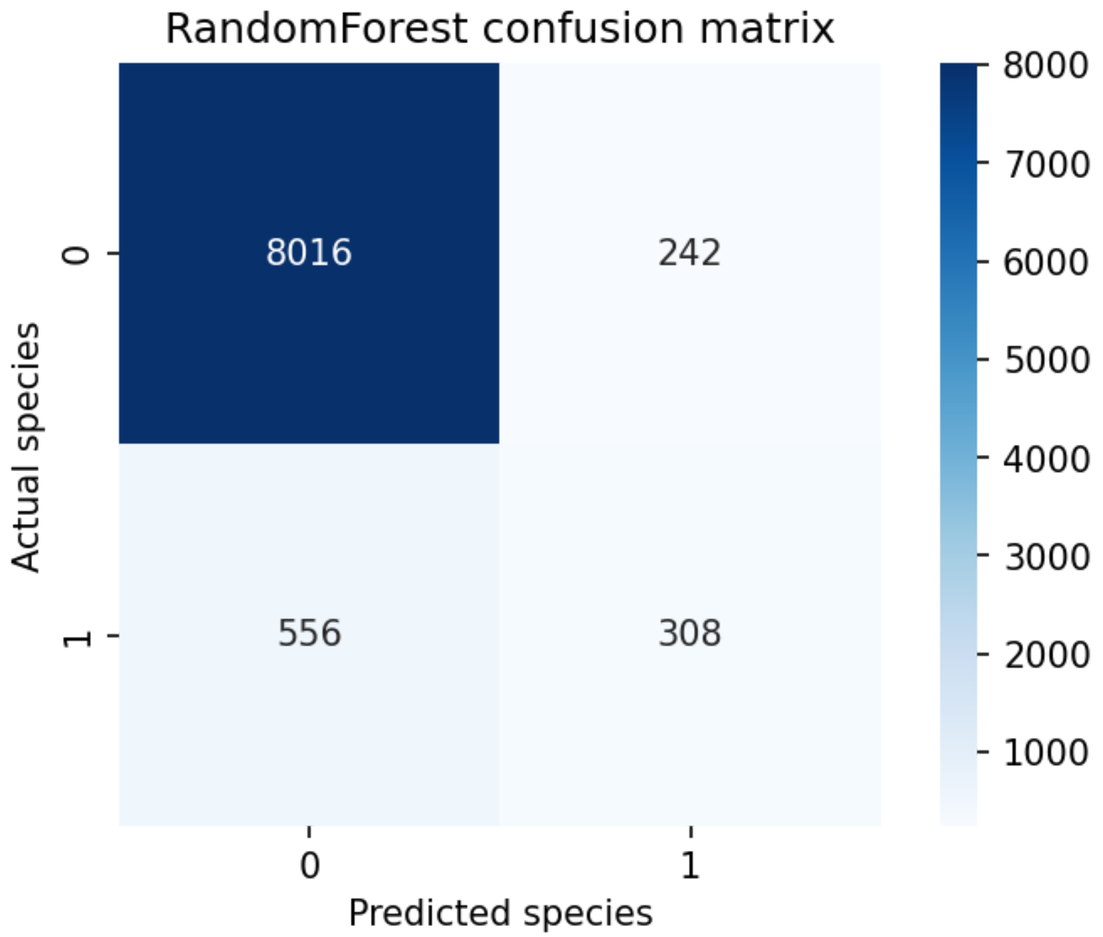
DECISION TREE

Train	99%
Test	86%



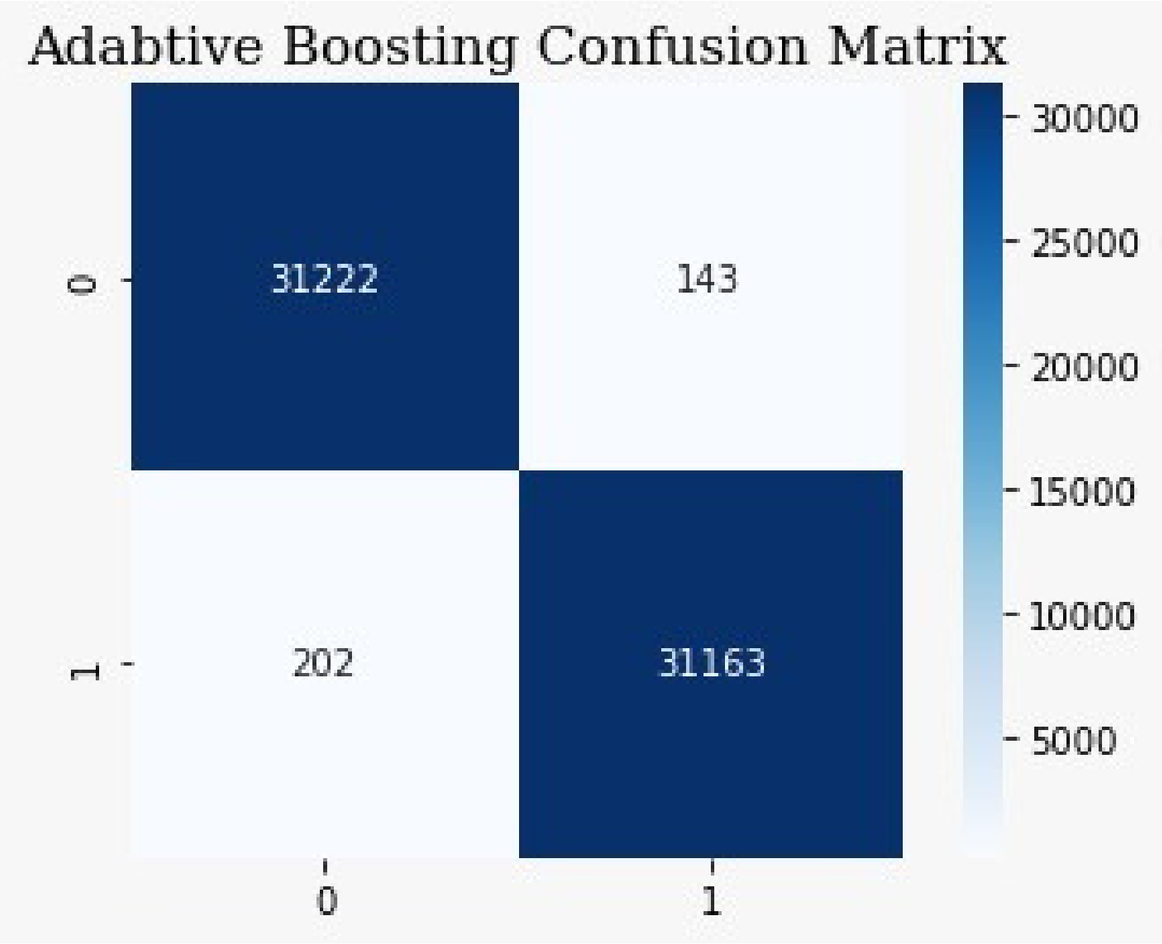
RANDOM FOREST

Train	**99%**
Test	**91%**



ADABTIVE BOOSTING

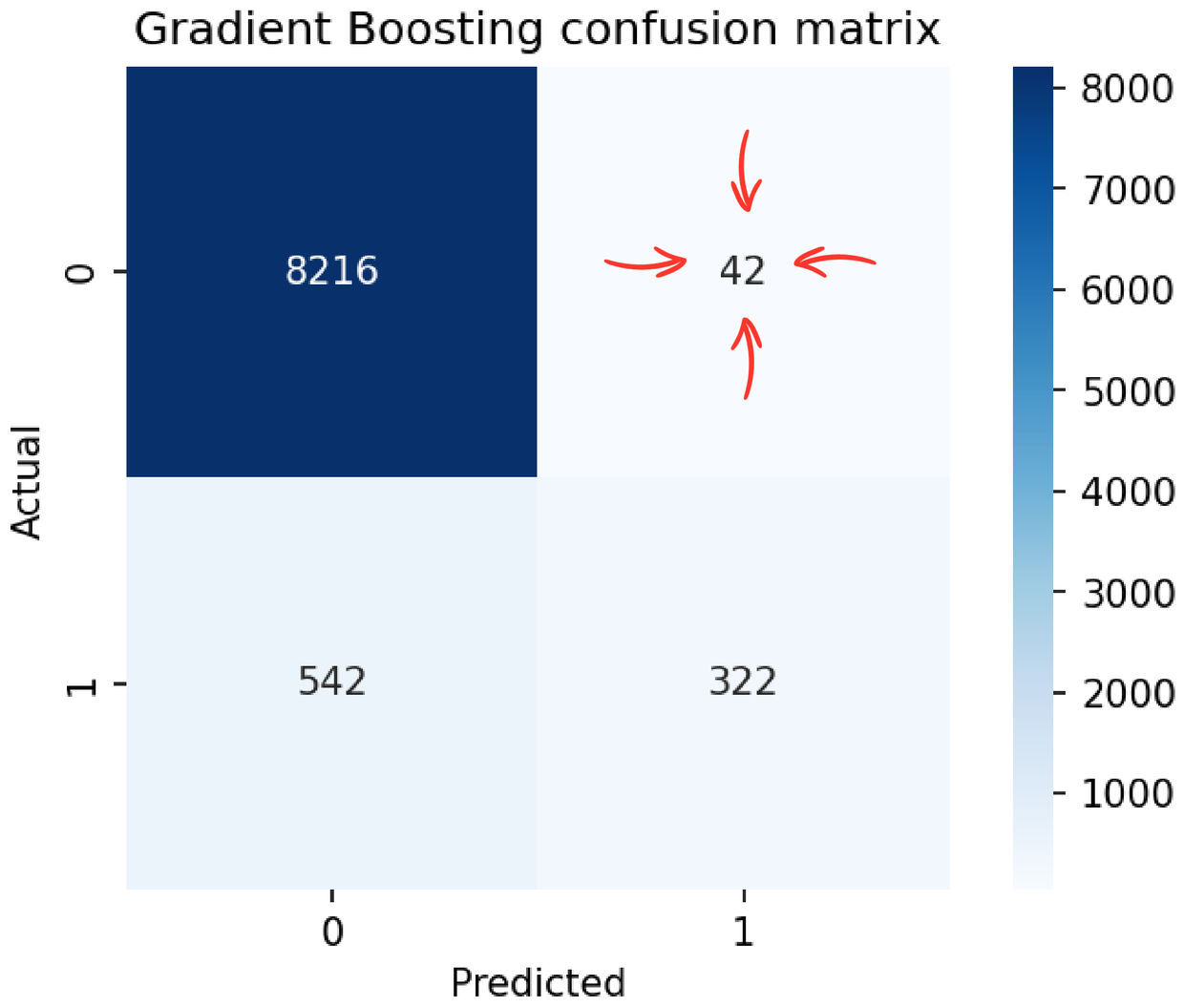
Train	**99%**
Test	**89%**



GRADIENT BOOSTING

Train 96%

Test 93%



CLASSFICATION REPORT OF GRADIENT BOOSTING

	precision	recall	f1-score	support
0	0.93	0.99	0.96	7778
1	0.85	0.36	0.50	888
accuracy			0.93	8666
macro avg	0.89	0.68	0.73	8666
weighted avg	0.92	0.93	0.91	8666

CONCLUSION
&
Future WORK

- We choose the best performance model that is Gradient Boosting Classifier depends on **accuracy** and **precision**, **recall**

- We working for the distribution of this model to almost all companies in Saudi Arabia

THANKS !