

Group 2 | 2020.06.15

FINAL PRESENTATION

AGENDA

- **Introduction**
 - League of Legends
- **Data Description**
 - Variables
 - Sources
- **Target**
- **Algorithms Selection**
 - Logistic Regression
 - LDA
 - QDA
 - Gaussian Naive Bayes
 - Random Forest Classifier

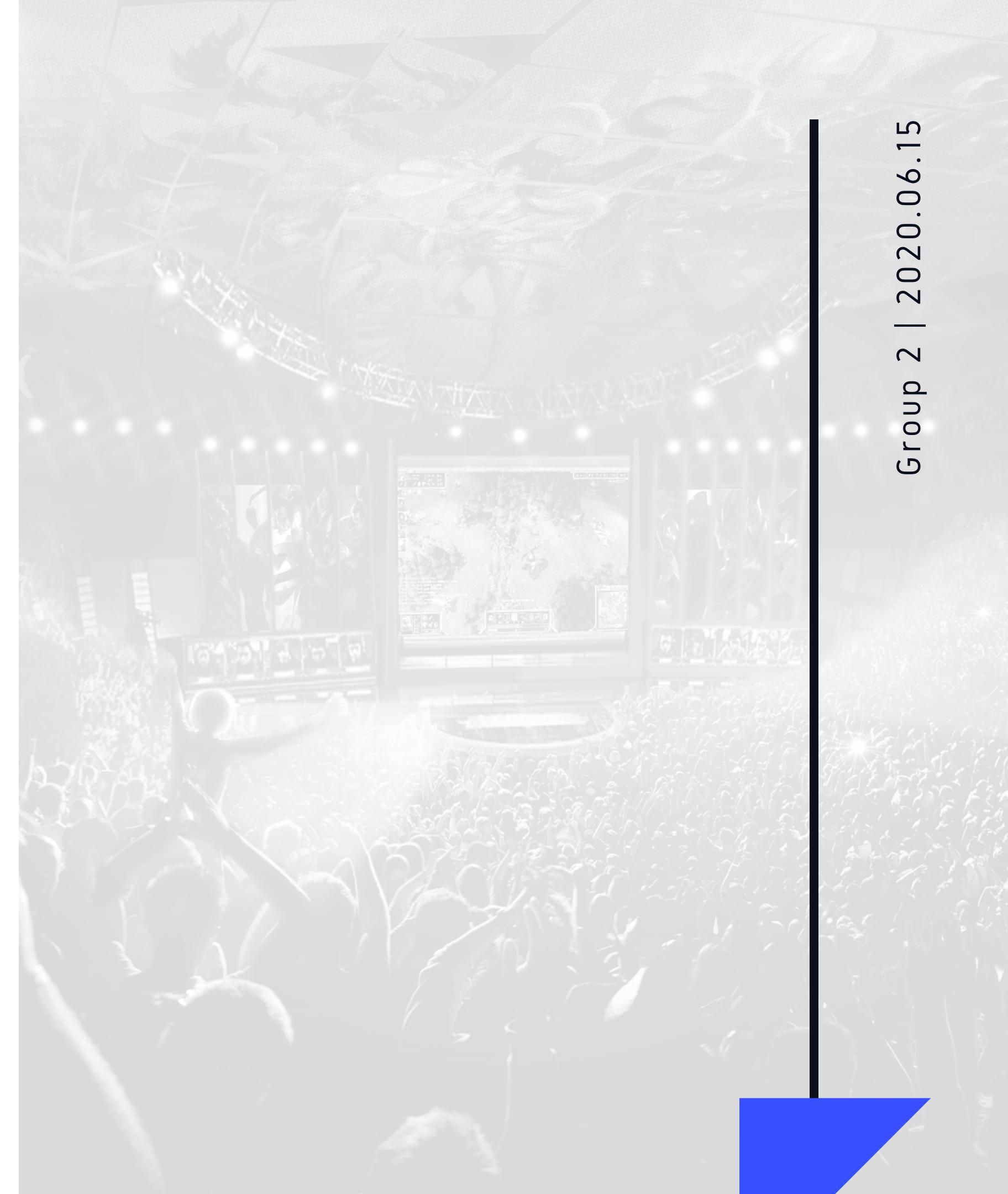
AGENDA

- Comparison
 - ROC curves
 - Which one is better?
- Application
 - 6/14 LPL data
- Review
- Conclusion
- Future work
- References & Code
- Thanks

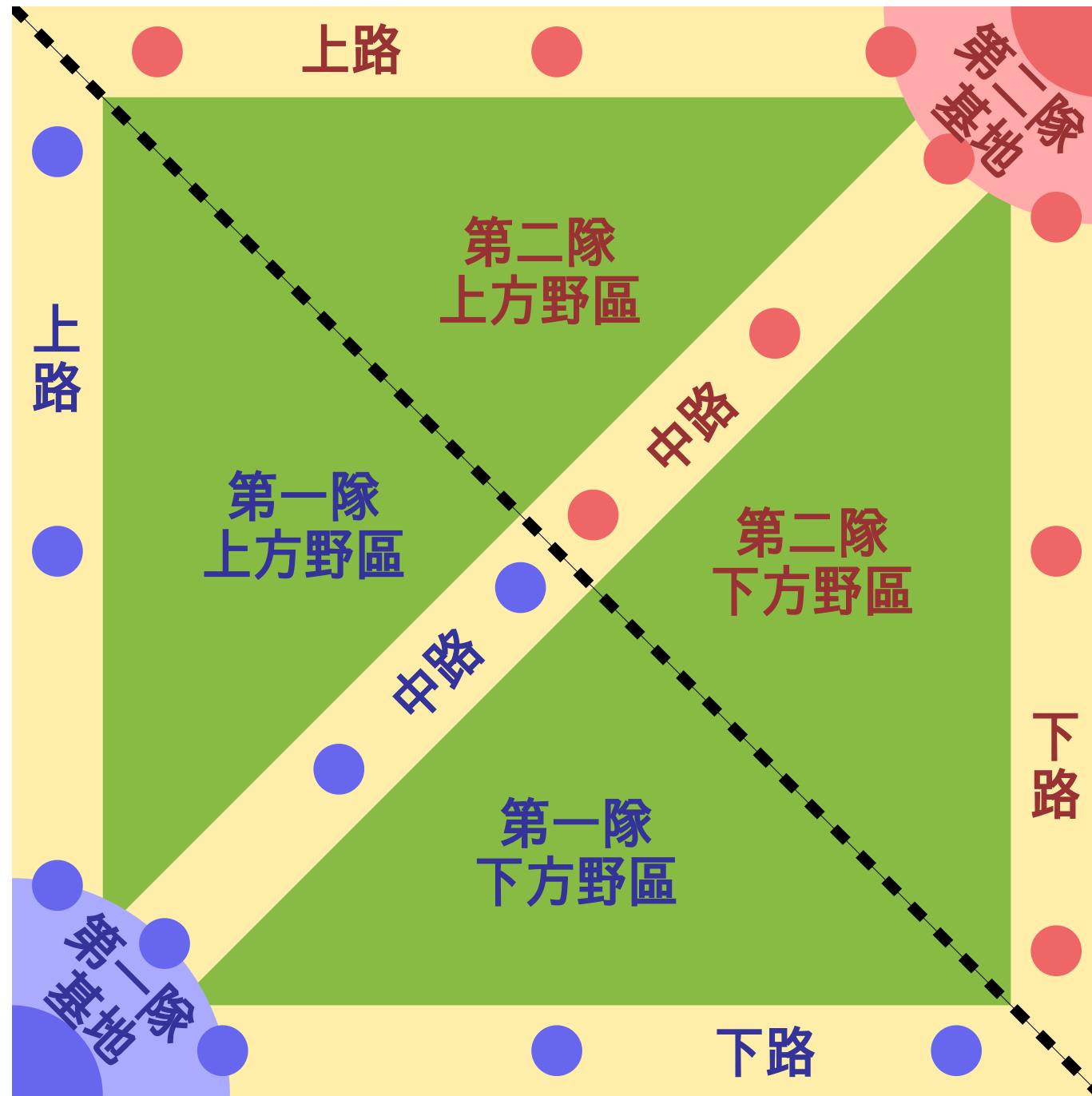
INTRODUCTION

League of Legends

MOBA game in TPP, 5v5 Summoner's Rift.



規則介紹 - 地圖



- 一場遊戲有兩隊，分為藍紅方，每隊各有5個人，每個人自由選擇一個英雄。
- 玩家的帳戶會根據ELO等級分制度進行排名並時時調整，再經由系統自動配對，因此在一場遊戲中，雙方團隊的玩家有著相當的遊戲水準。
- 地圖裡有三條路，分為上路、中路、下路，藍方主堡在左下，紅方主堡在右上。
- 圖中藍(紅)點為防禦塔位置，再加上基地主堡前的兩座，每隊共11座。
- 野區為野怪生活的區域。

規則介紹 - 物件

- 建築物：兩隊都希望保護自己的建築物，並搗毀對方的建築物。
 - 防禦塔：負責保護友方陣營，攻擊附近的對方陣營小兵及玩家角色。
 - 水晶兵營：每條路各有一個，被摧毀後，會讓對方那條路的小兵變強。
 - 主堡：兩方各有一個主堡，先破壞對方主堡的那一方贏得比賽勝利。
- 小兵：主堡會不斷地創造小兵，沿著上路、中路和下路不斷前進，直到接觸對方單位。
- 中立生物：
 - 野怪：殺死它們的玩家可以取得經驗和金錢。部分大型野怪會提供額外增益效果。
 - 預示者：擊殺預示者之後可以拾取預示者之眼，並在路上召喚出來協助隊伍，幫助隊伍推塔。
 - 飛龍：殺死飛龍的隊伍可以依不同的飛龍類型，取得維持整場遊戲的相應增益效果。
 - 巴龍：在遊戲開始的二十分鐘會取代預示者現身。(但此資料集只取遊戲前十分鐘所以無須考慮)

規則介紹 - 機制

- 等級：每場遊戲開始時，每位英雄的等級皆是1，並且會隨著獲得經驗值而升等，最終達到18級。升等後玩家可以解鎖英雄技能，並因此拿到對戰優勢。
- 金錢：遊戲裡的金錢可用來購買道具，讓英雄變得更強、殺死對方英雄或幫助友方英雄。
獲取方式如下：
 - 隨著遊戲時間經過自然取得（慢）
 - 殺死小兵和野怪
 - 殺死敵方隊伍的英雄
 - 崩毀敵方的建築物
- 獲勝條件：
 - 崩毀對方的主堡
 - 經濟差距過大，使對方提早投降

DATA DESCRIPTION

Kaggle: LOL Diamond
Ranked Games(10 min)

KDA, EliteMonsters, Gold, Minions,



TARGET

USING THE FIRST TEN MINUTES DATA TO PREDICT
THE FINAL GAME RESULT.

ALGORITHMS SELECTION

LOGISTIC REGRESSION

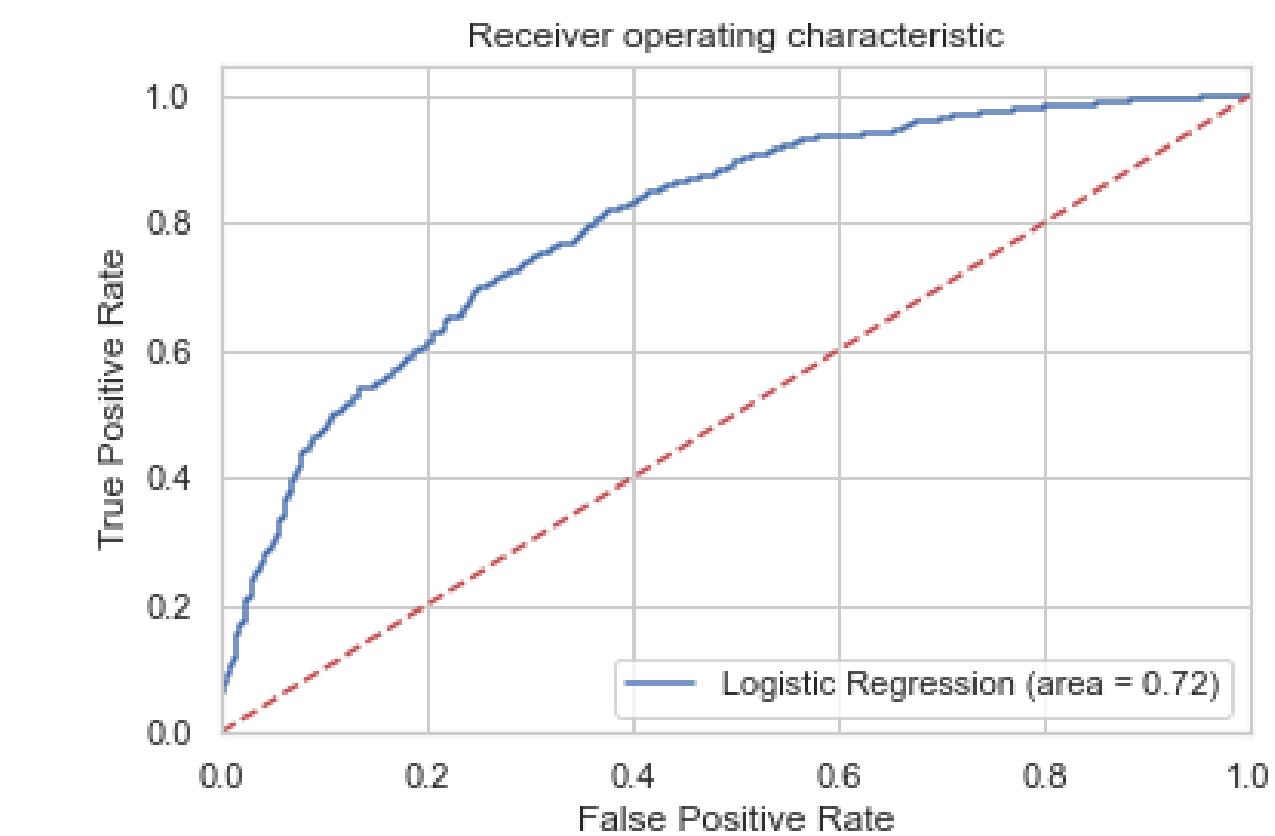
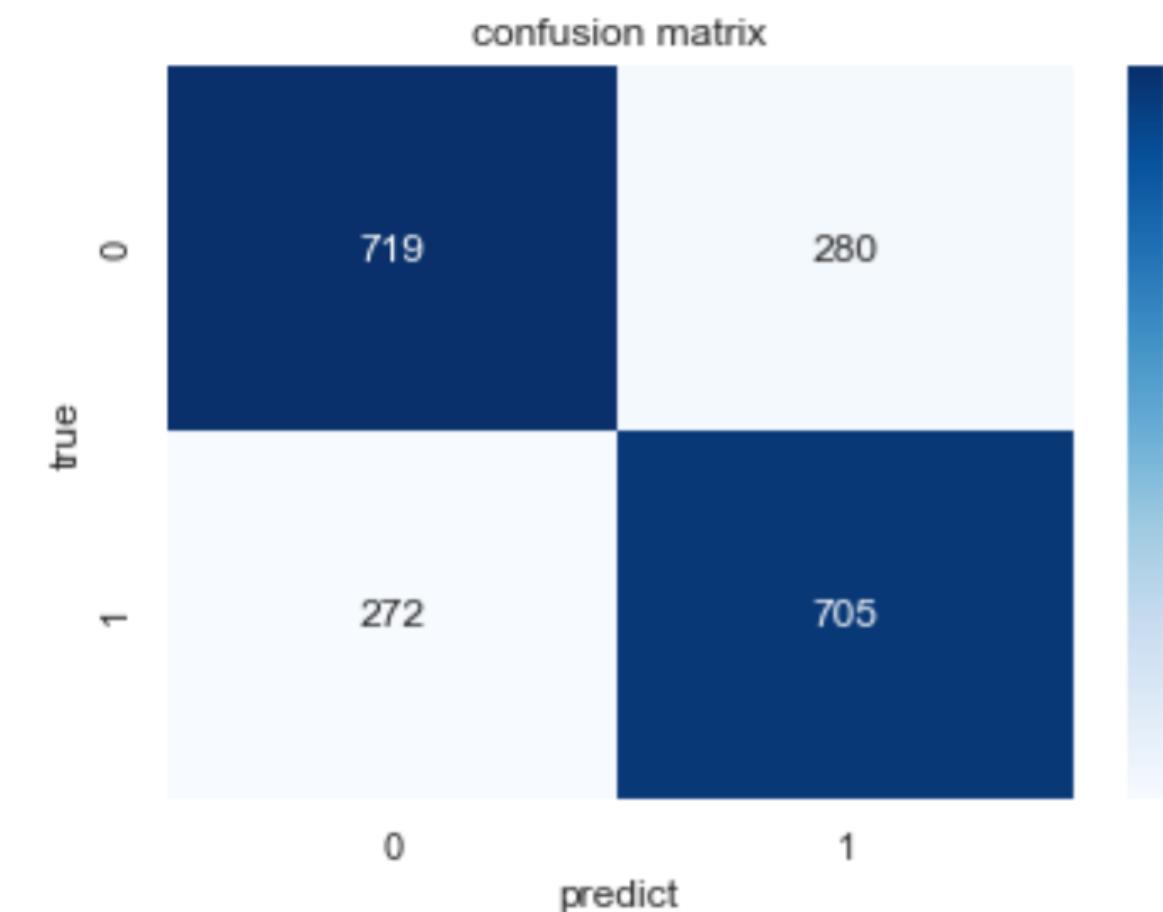
LINEAR DISCRIMINANT
ANALYSIS(LDA)

QUADRATIC DISCRIMINANT
ANALYSIS(QDA)

GAUSSIAN NAIVE BAYES

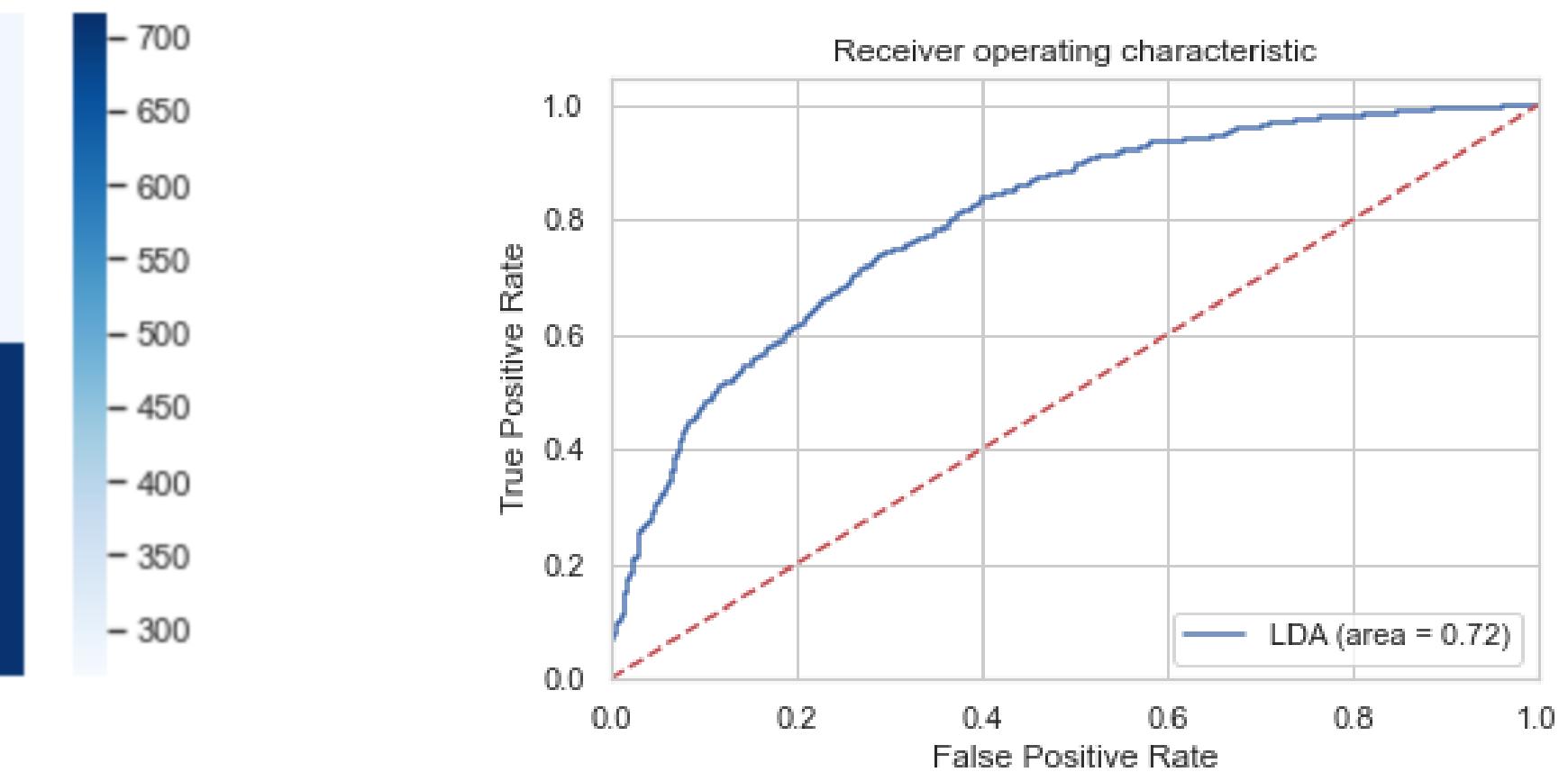
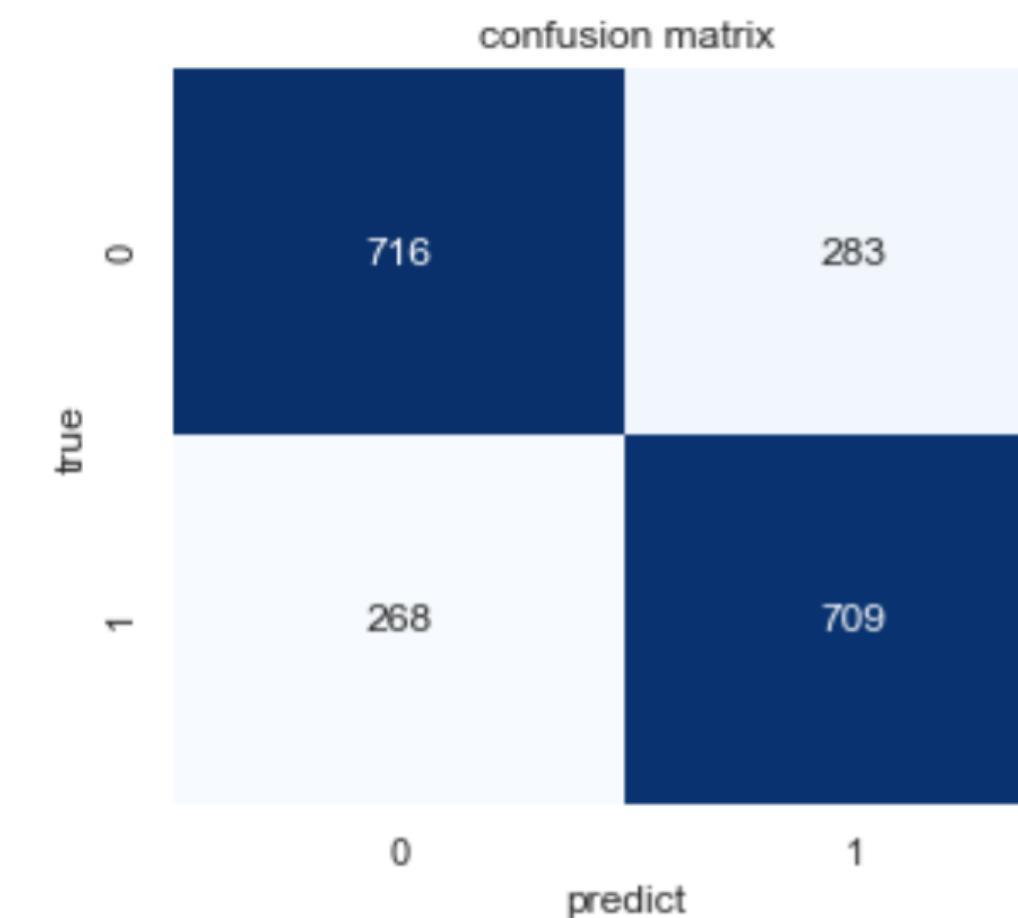
RANDOM FOREST
CLASSIFIER

LOGISTIC REGRESSION



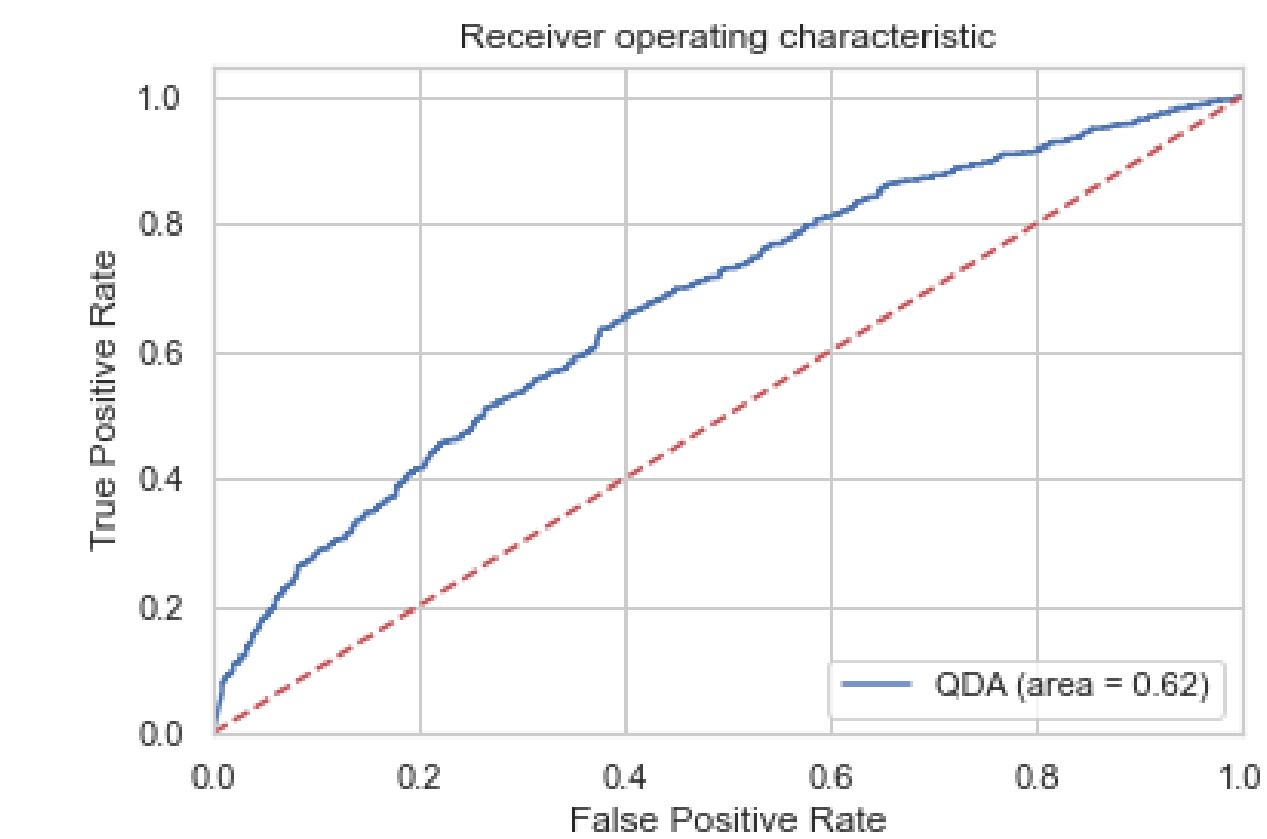
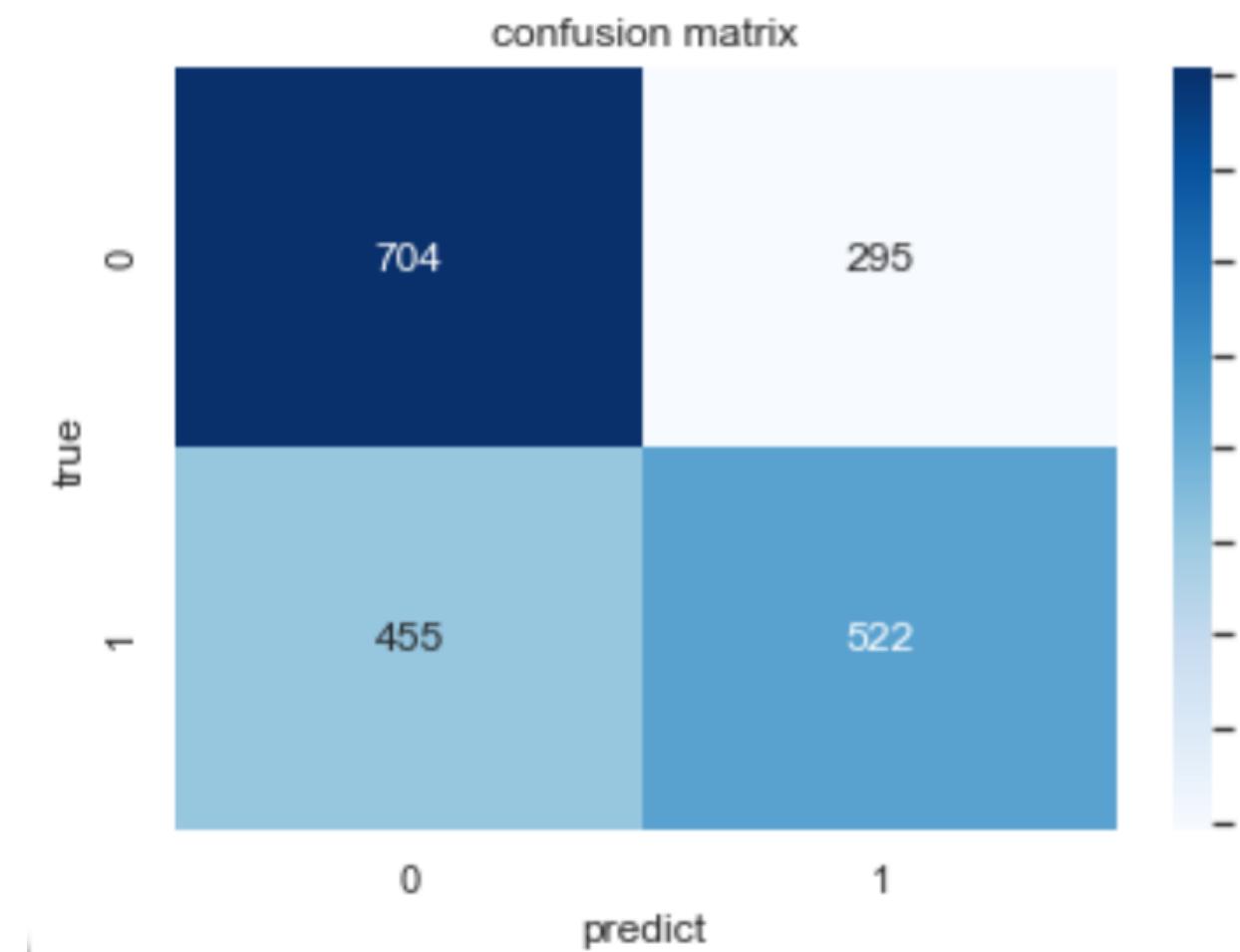
ACCURACY : 0.7206477732793523

LINEAR DISCRIMINANT ANALYSIS



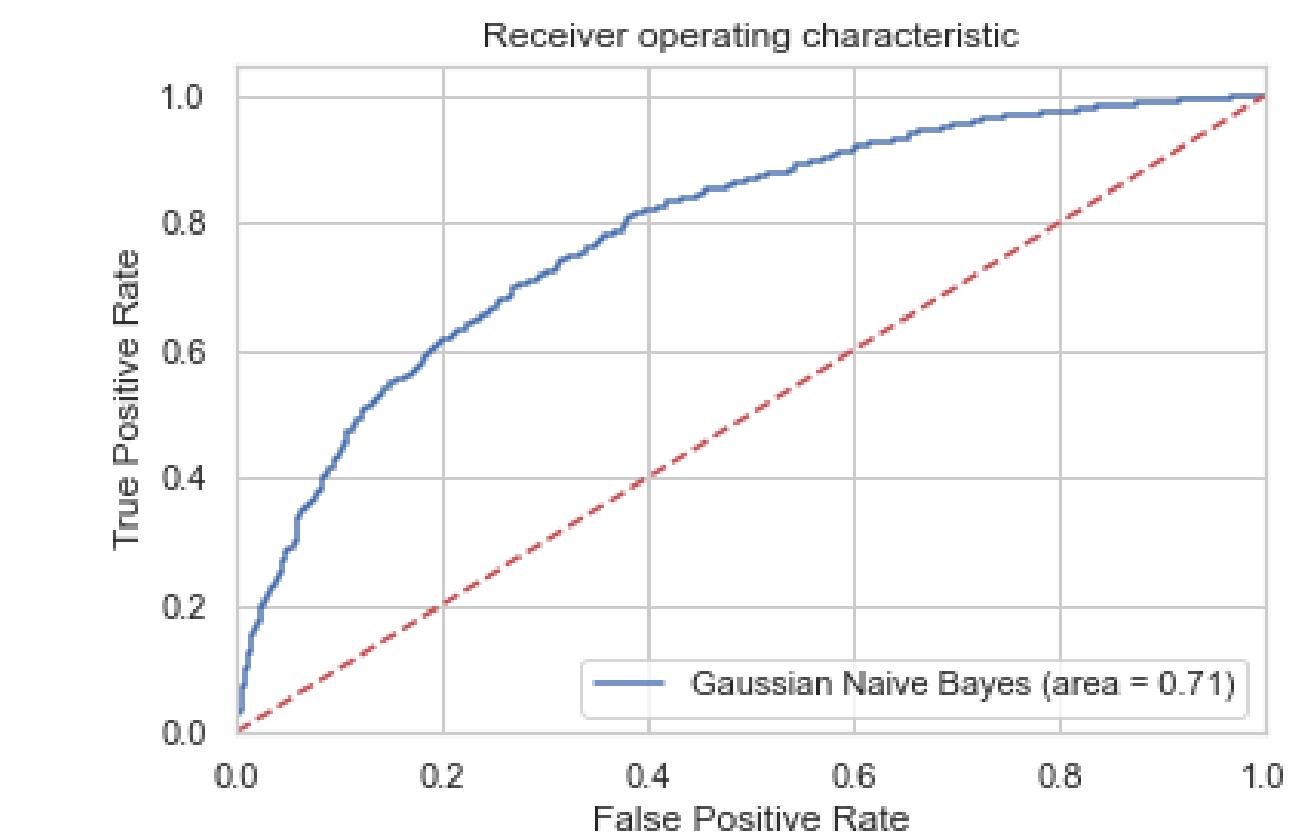
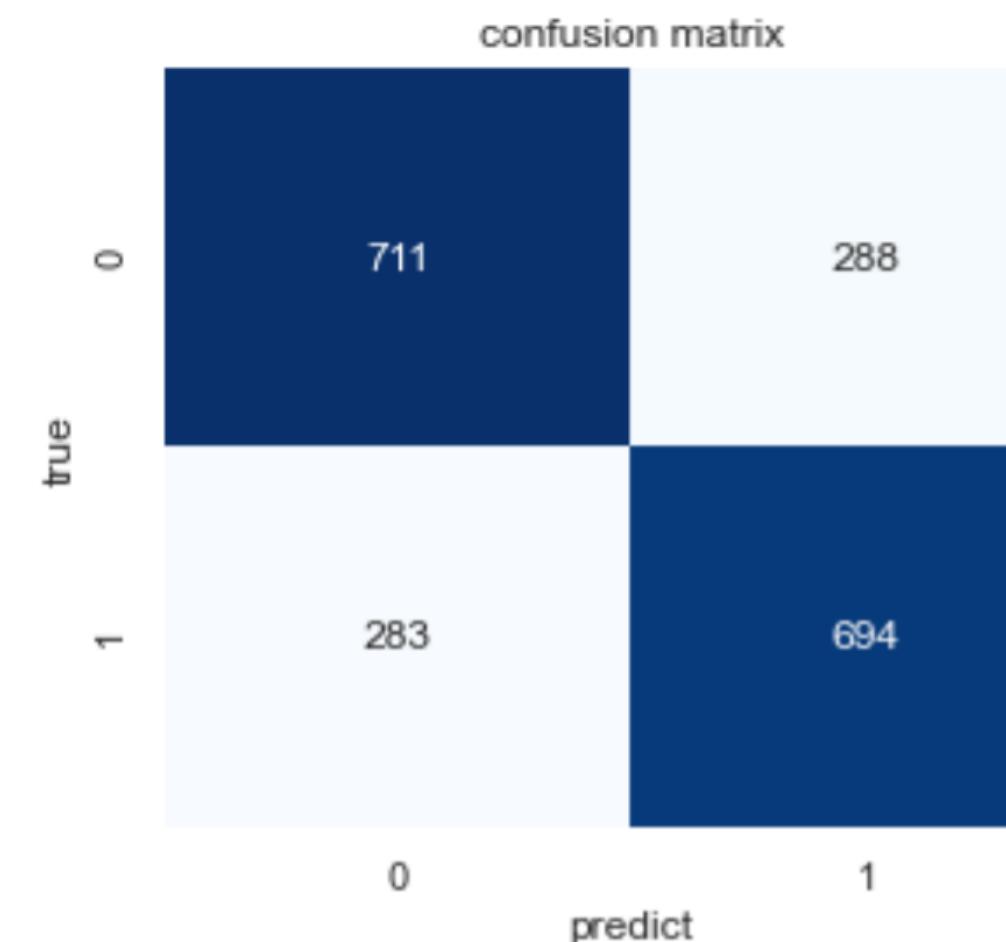
ACCURACY : 0.7211538461538461

QUADRATIC DISCRIMINANT ANALYSIS



ACCURACY : 0.6204453441295547

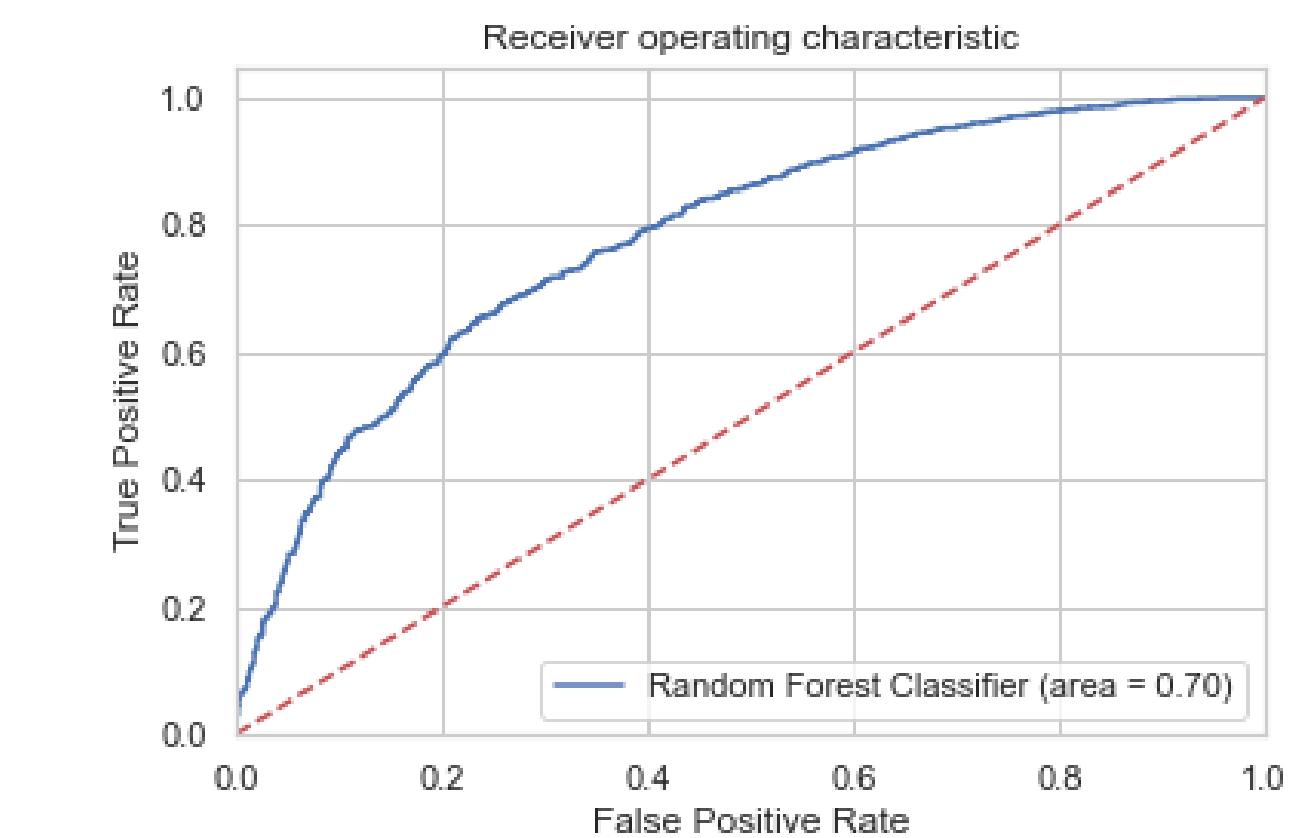
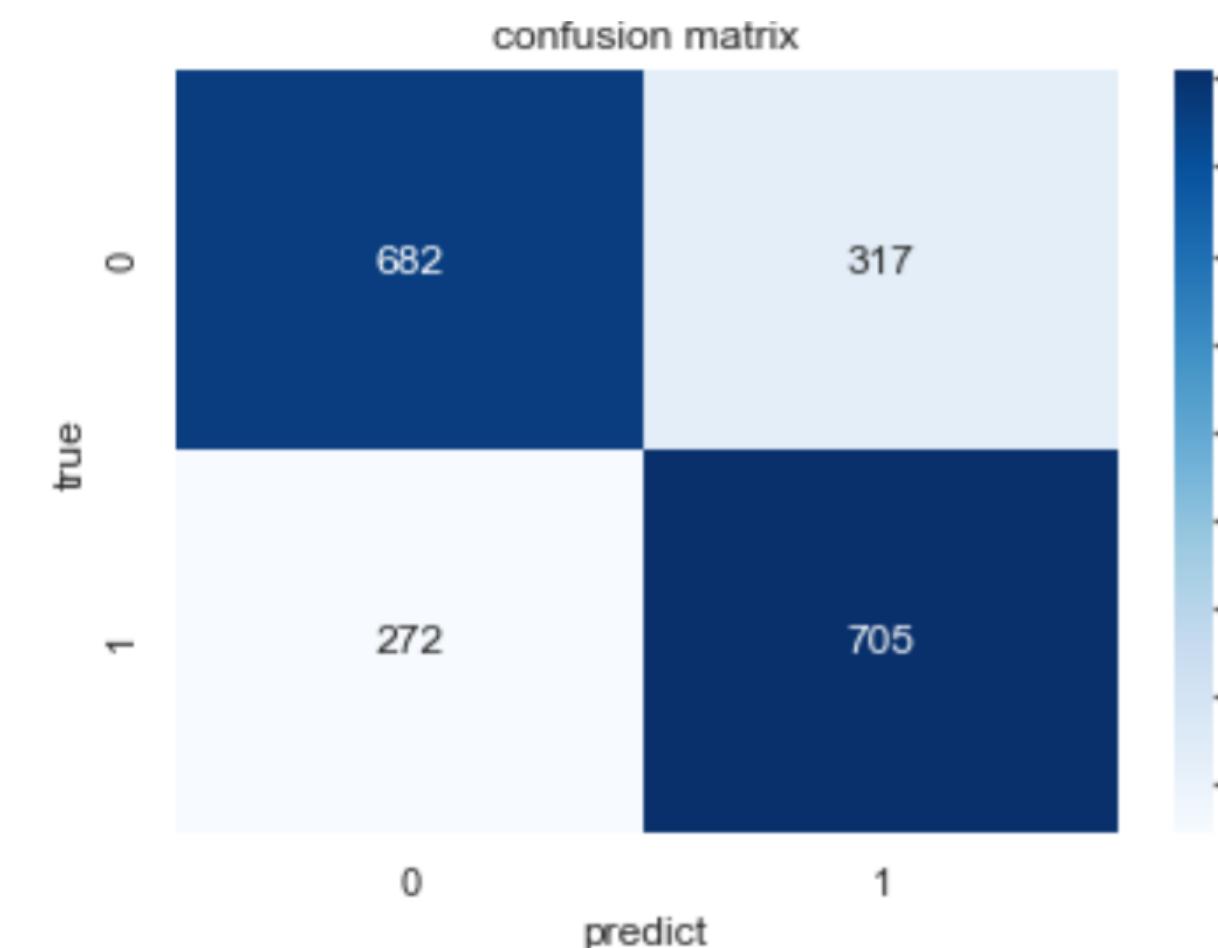
GAUSSIAN NAIVE BAYES



ACCURACY : 0.7110323886639676

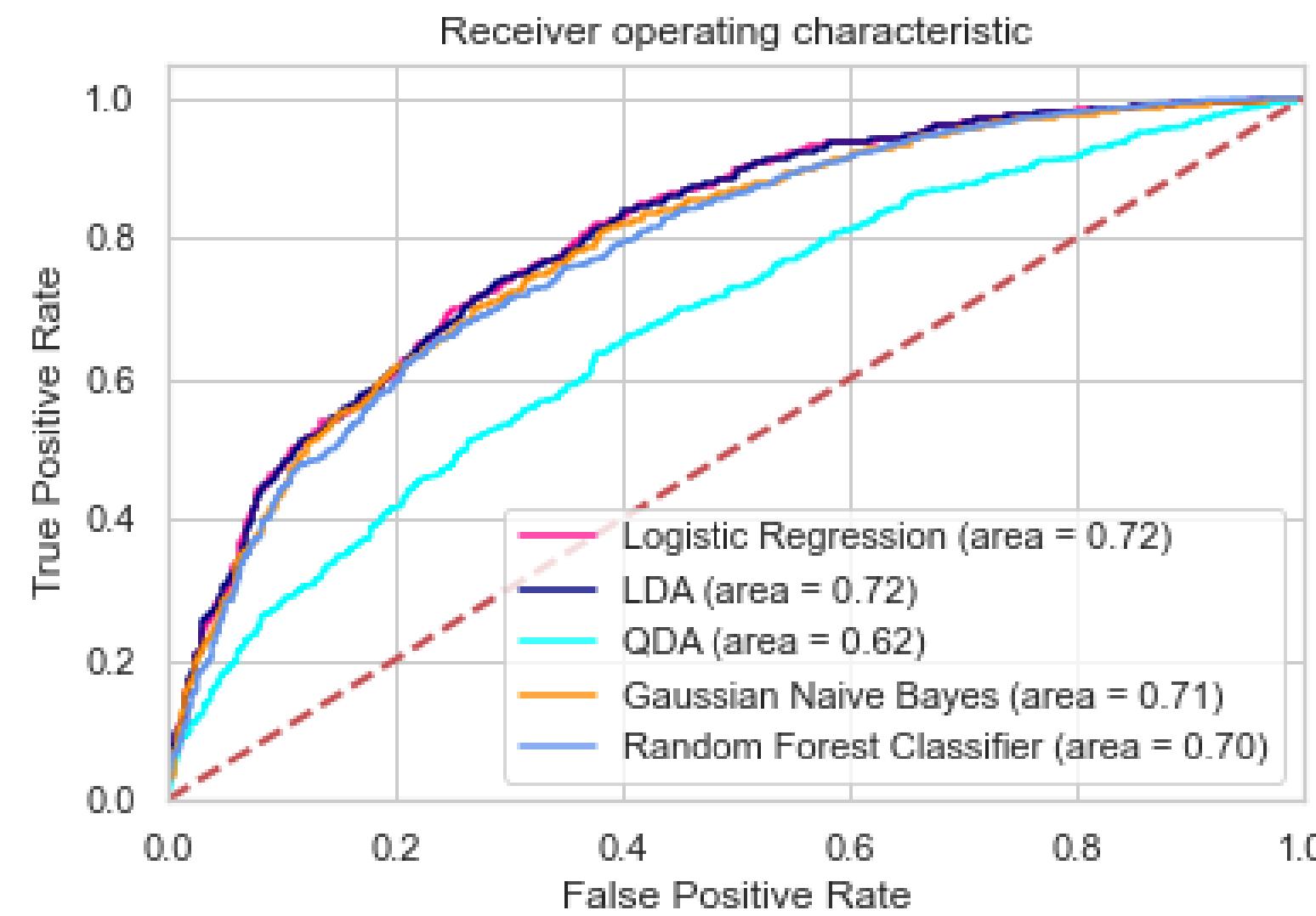
RANDOM FOREST CLASSIFIER

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ACCURACY : 0.7019230769230769

COMPARISON



70~72%

- Logistic Regression
- Linear Discriminant Analysis

APPLICATION



6/10, 6/12 LPL

SN VS. JDG

G1 : JDG win(red)

G2 : JDG win(blue)

FPX VS. BLG

G1 : FPX win(red)

G2 : FPX win(blue)

APPLICATION



6/10, 6/12 LPL

OUR MODEL

SN VS. JDG

G1 : JDG win(red)

G2 : JDG win(blue)

SN VS. JDG

G1 : red win

G2 : blue win

FPX VS. BLG

G1 : FPX win(red)

G2 : FPX win(blue)

FPX VS. BLG

G1 : blue win

G2 : blue win

ACCURACY:0.75

REVIEW

```
blueFirstBlood : 0.008633374455924572
blueKills : 0.020419041544824653
blueDeaths : -0.02591523129393104
blueAssists : -0.11729689442369616
blueEliteMonsters : 0.07084077548704963
blueDragons : 0.10807263714000398
blueHeralds : -0.0198420309396858
blueTotalGold : 0.8545828557979
blueAvgLevel : 0.12992330302933458
blueTotalMinionsKilled : -0.05168506533036152
redKills : -0.02591523129393104
redDeaths : 0.020419041544824653
redAssists : 0.032549127928200805
redEliteMonsters : -0.06329747963170879
redDragons : -0.08938324935421119
redHeralds : 0.011811191741359112
redTotalGold : -0.7387560225994326
redAvgLevel : -0.1678763050704996
redTotalMinionsKilled : 0.07085421420741589
intercept: 0.0032176539536389846
```

REVIEW

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redAssists : 0.032549127928200805
redEliteMonsters : -0.06329747963170879
redDragons : -0.08938324935421119
redHeralds : 0.011811191741359112
redTotalGold : -0.7387560225994326
redAvgLevel : -0.1678763050704996
redTotalMinionsKilled : 0.07085421420741589
intercept: 0.0032176539536389846
```

Blue always win?

0.85/0.73-1=16% TotalGold

CONCLUSION

CONSIDER MORE FEATURES

We didn't consider the champions selection, the strength of each team, the player's talent, and so on.

DIFFERENT SERVER/GAME VERSION

EU patch 10.7/10.8 vs. CN patch 10.11

MAYBE 10 MINUTES CAN'T DECIDE THE OUTCOME

It's always possible to turn the game around.



FUTURE WORK

**CRAWL DATA OF PRO GAME
TO TRAIN AND TEST**

**USING DATA OF OURSELVES
TO TEST**

ENSEMBLE LEARNING

REFERENCE & CODE

KAGGLE

<https://www.kaggle.com/bobbyscience/league-of-legends-diamond-ranked-games-10-min>

PINNACLE/BET365

<https://www.pinnacle.com/en/>
<https://www.bet365.com/#/HO/>

WIKIPEDIA

[https://zh.wikipedia.org/wiki/%E8%8B%
%B1%E9%9B%84%E8%81%94%E7%9B%
%9F](https://zh.wikipedia.org/wiki/%E8%8B%B1%E9%9B%84%E8%81%94%E7%9B%9F)

CODE

[https://github.com/behind3220/rich_e
sport](https://github.com/behind3220/rich_e_sport)

THANK YOU
ANY QUESTIONS ?