Mining Steam

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Goal

Using games informations that the user owned to infer the continent they belong to.

Data Summary

52665 random users

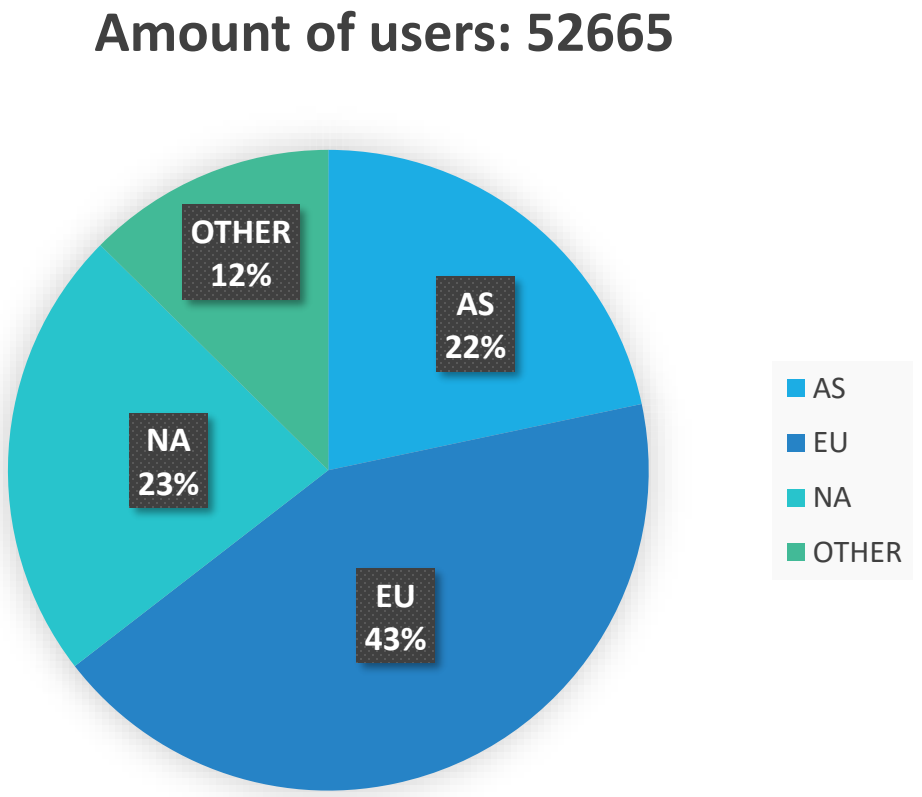
(>= 1 owned games):

AS: 21.68%, 11420

EU: 42.84%, 22564

NA: 22.87%, 12046

OTHER: 12.6%, 6635



Data Summary

In last presentation, we‘ve proved with statistical method, users‘ region is related to the following features:

amount of games

playtime of games

which game they own

Data Structure

Combining these features, we created the vector as following:

[game_amount, game1_playtime, game2_playtime, game3_playtime, ...]

(playtime of the 100 most popular games)

Define An Easy Classifier

Baseline: for those who has more than the average game amount of users from EU, we assume that they're from EU.

Define An Easy Classifier

Result:

	predict->EU	predict->OTHER
real EU	5852 (TP)	16712 (FN)
real OTHER	7361 (FP)	22740 (TN)

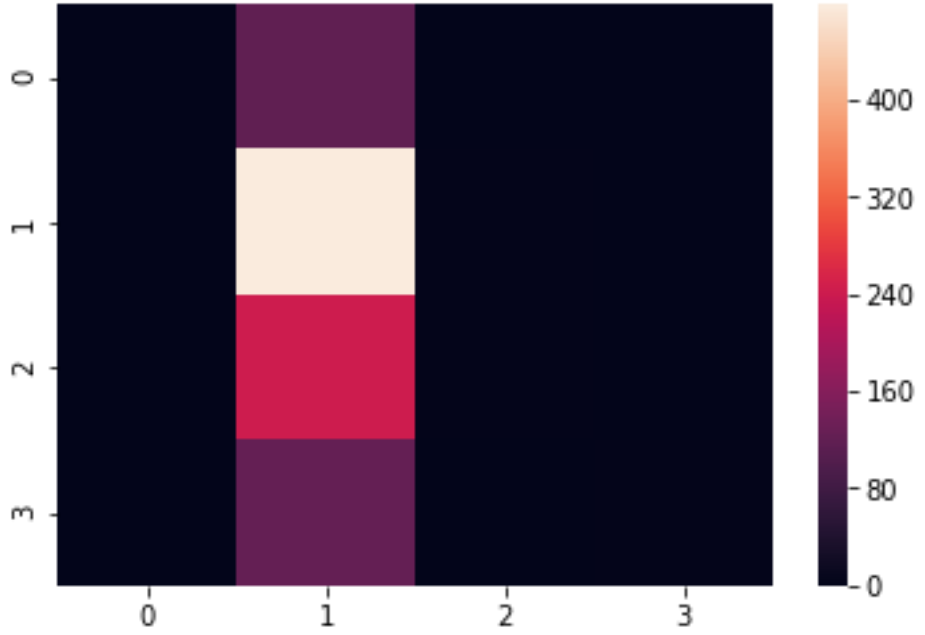
precision	recall	f1
44%	26%	33%

Machine Learning

- SVC, Adaboost
- PCA
- MinMaxScaler, GridSearch
- Adjusting dataset

Classifier-SVC

	precision	recall	f1-score
AS	0.50	0.01	0.02
EU	0.50	0.99	0.66
NA	0.40	0.01	0.02
OT	1.00	0.02	0.03
avg	0.54	0.50	0.34



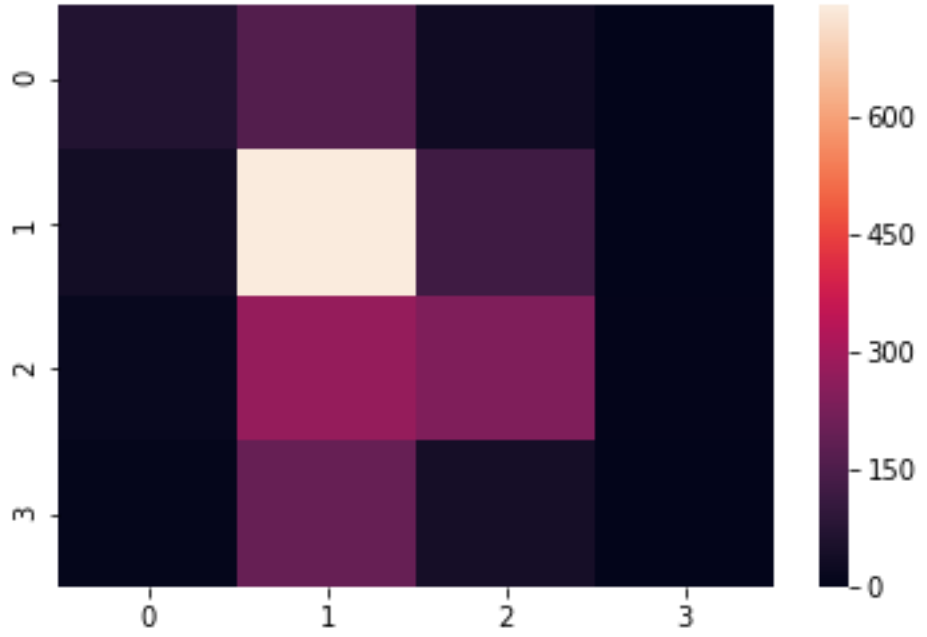
SVC

After using GridSearch and MinMaxScaler(), we can also get a better result from SVC.

	precision	recall	f1-score
AS	0.44	0.15	0.23
EU	0.53	0.88	0.66
NA	0.50	0.24	0.32
OT	0.08	0.00	0.01
avg	0.46	0.52	0.44

Classifier-AdaBoost

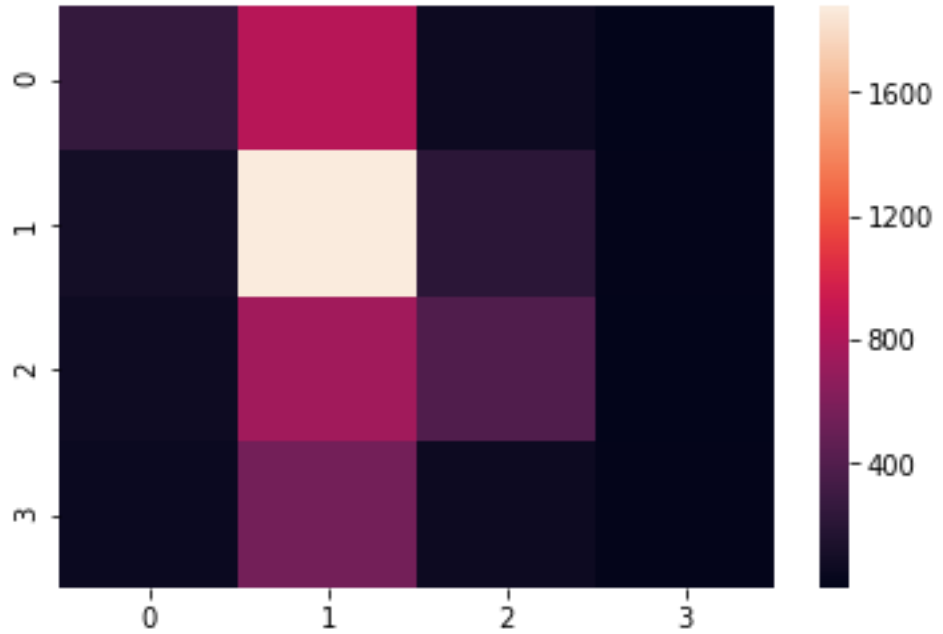
	precision	recall	f1-score
AS	0.54	0.27	0.36
EU	0.54	0.82	0.65
NA	0.55	0.45	0.49
OT	0.14	0.00	0.01
avg	0.49	0.54	0.49



PCA(Principal component analysis)

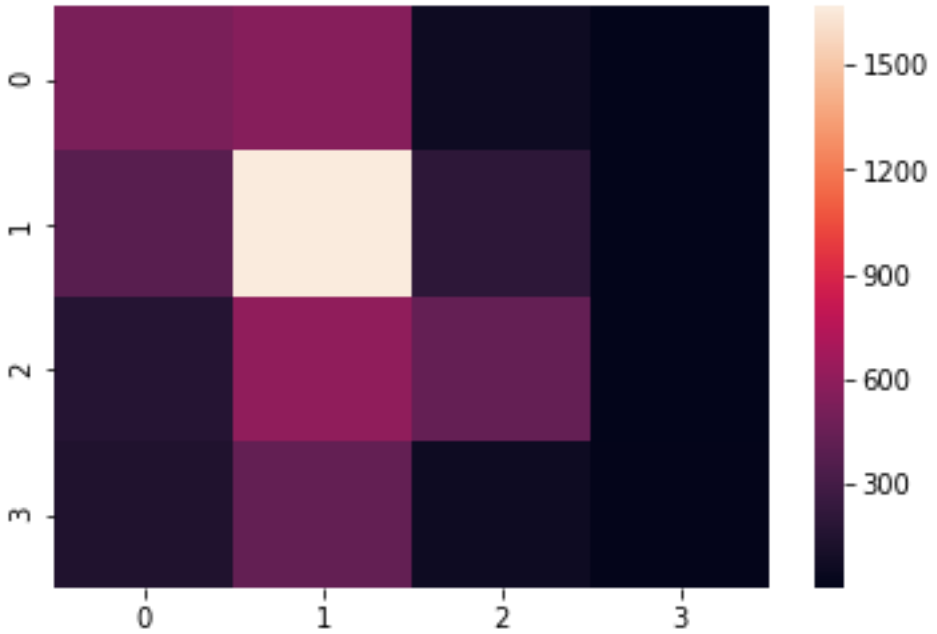
- Reduce noise
- Compress components(101 -> 90, still keep 99.7% information)

PCA(Principal component analysis)



without PCA

Avg-F1: 0.46



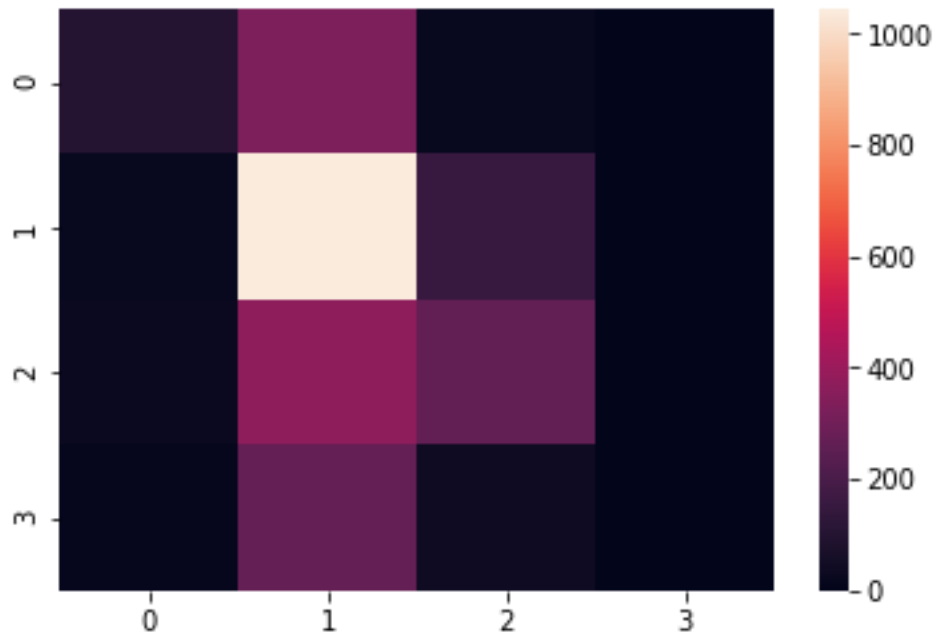
with PCA

Avg-F1: 0.49

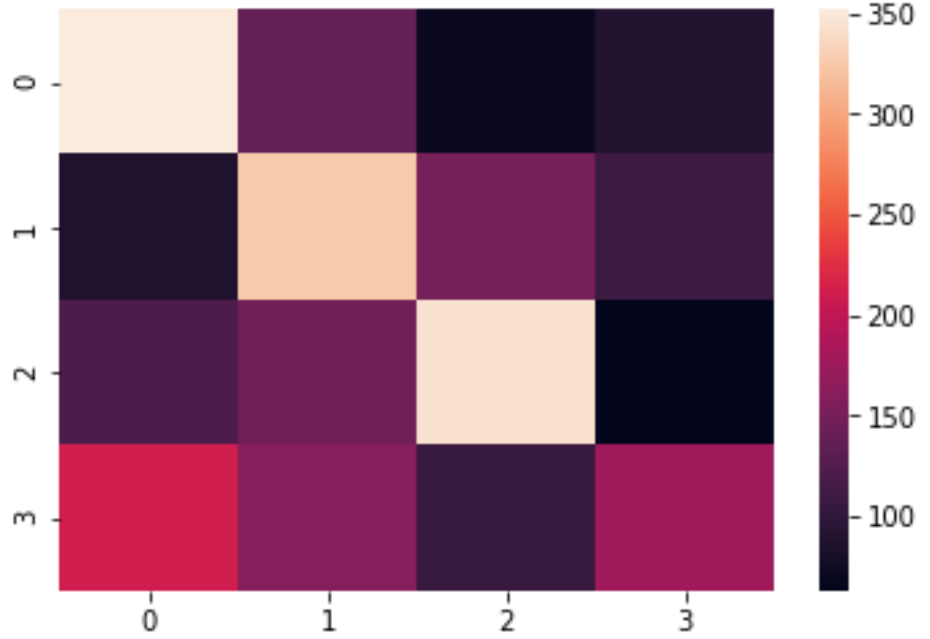
Adjusting Dataset

Almost half of the users are from Europe, so we tried to create a dataset, which the number of users from EU, AS, NA, OTHER are same.

Adjusting Dataset



Adaboost(normal-dataset)
Avg-F1: 0.47



Adaboost(equal-distributed-dataset)
Avg-F1: 0.46

Summary

- The users from OTHER-continent usually don’t have common games
- Only by using games’ information is still not enough to precisely infer the region of the users.