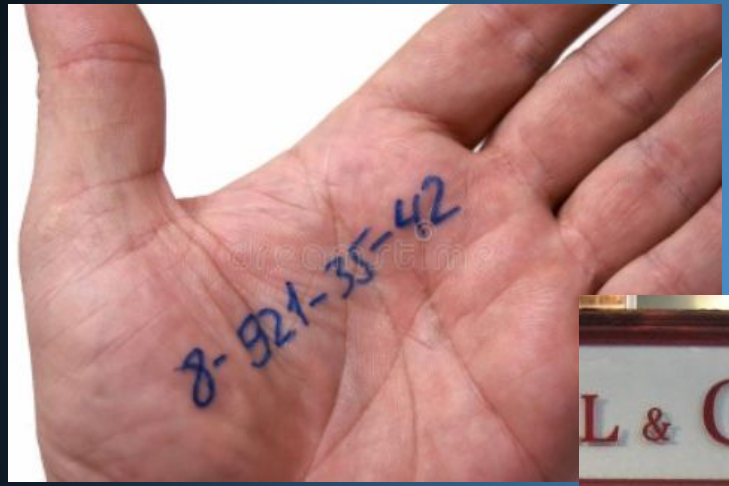
Bayesian inference

Use Case: Phone number scanner App

Aldo Narvaez Cao Romero

Why a phone number scanner?



NAME	PHONE NUMBERS
CAITY MOORLAND	870-555-2950, 179-555-2583, 359-555-3858
HANK TILNEY	569-555-1247, 359-555-3858
BELLA THURSTON	870-555-2489
EM WOODHOUSE	214-555-2358, 189-555-7841
ELLIE TILNEY	569-555-1247, 359-555-3859
JANE BENNETT	459-555-1596, 459-555-1896, 189-555-8746
CATHY BENNETT	459-555-1596, 459-555-1900
LIZ BENNETT	459-555-1596, 459-555-1897, 357-555-1864
LYDIA BENNETT	459-555-1596, 459-555-1899, 789-555-1688
[illegible]EM	789-555-1688
[illegible]HT	874-555-3871, 189-555-7841
[illegible]LY	849-555-1458, 189-555-8746
[illegible]Y	849-555-1458, 189-555-8746
[illegible]ETT	459-555-1596, 459-555-1898
[illegible]RGH	871-555-6213
[illegible]RCEY	871-555-1687, 357-555-1864
[illegible]NE	687-555-1865

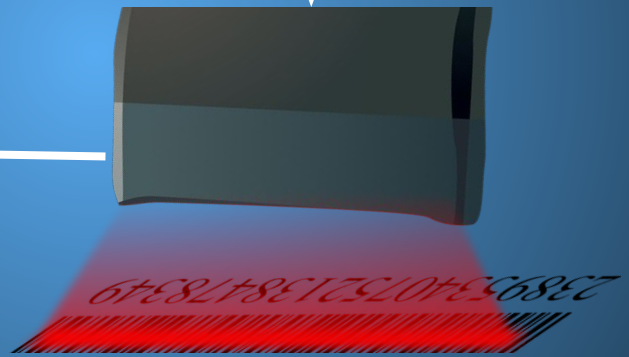

PHONSCANN
Phone Number
Account number
Wi-Fi password
Advertisement space

Phone Number

PhoneScann Would Like to Access Your Contacts

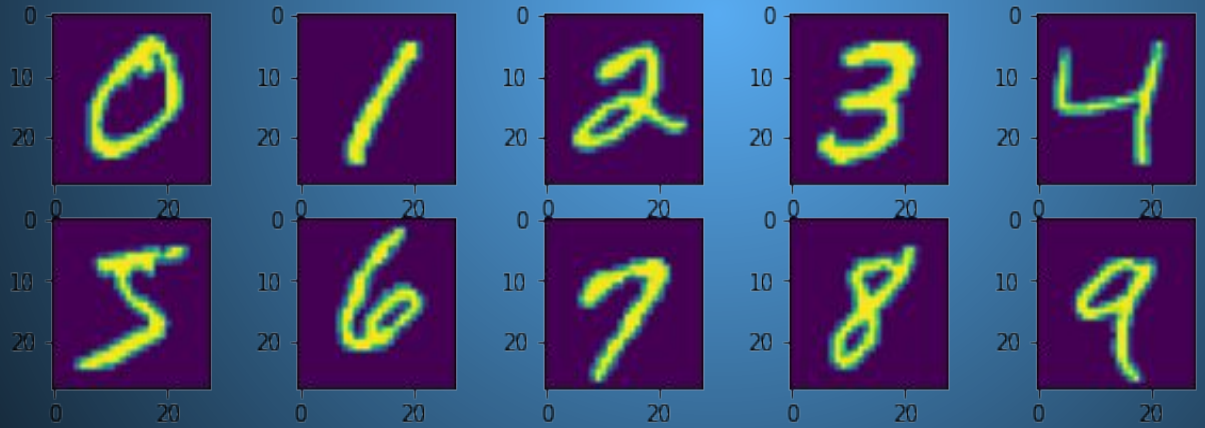
This lets you see which of your friends are on

Don't Allow | OK



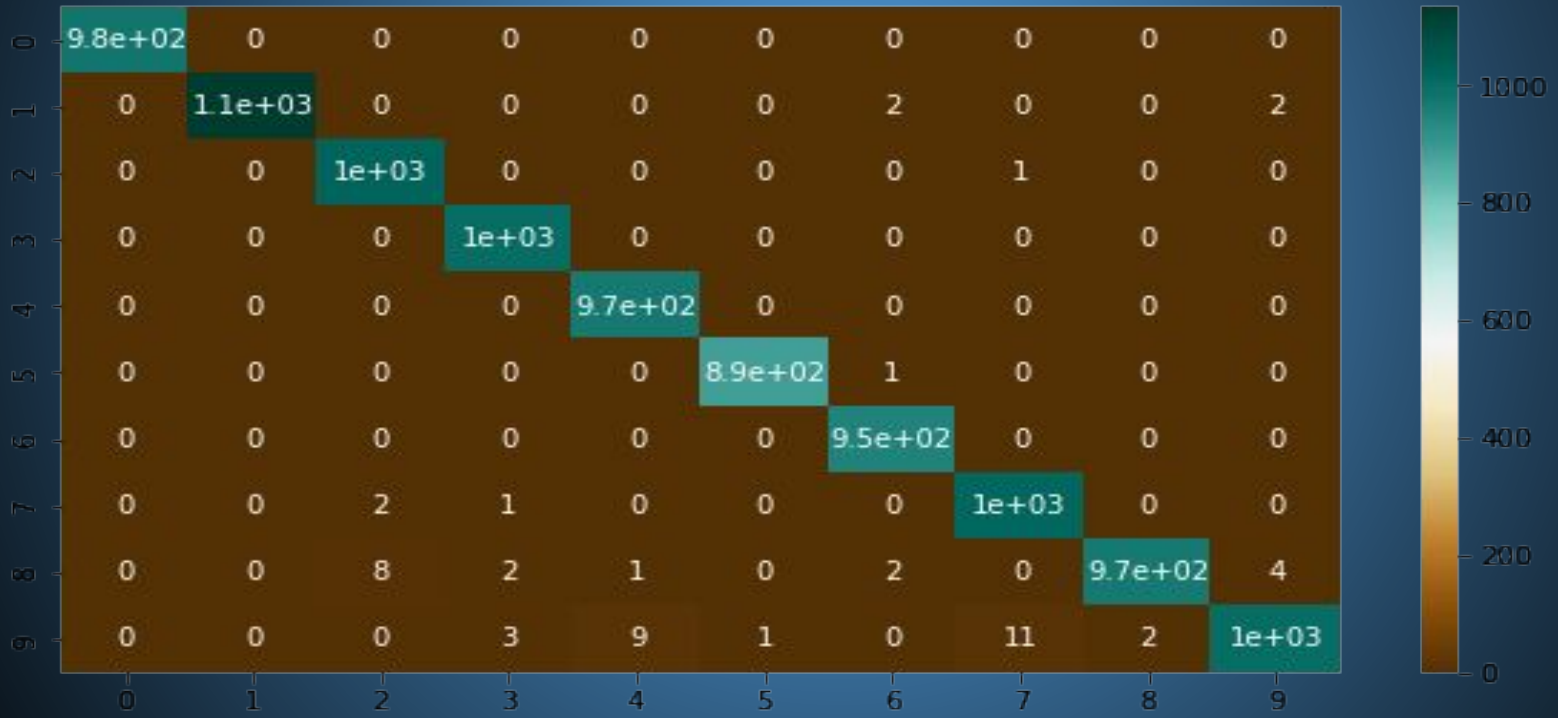
How does it work?

- It was used the Gaussian Bayes algorithm as a cornerstone in the App.
- We take a collection of encoded handwritten numbers to use them has a database.



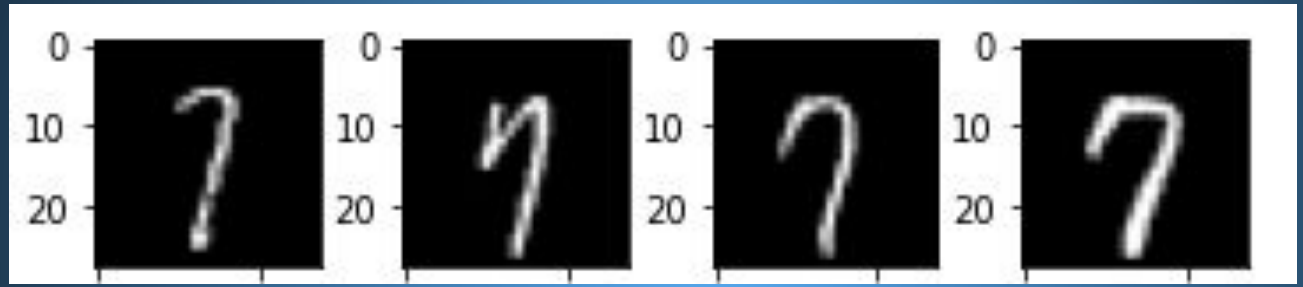
Effectiveness

It was found a 99% of accuracy in the model.

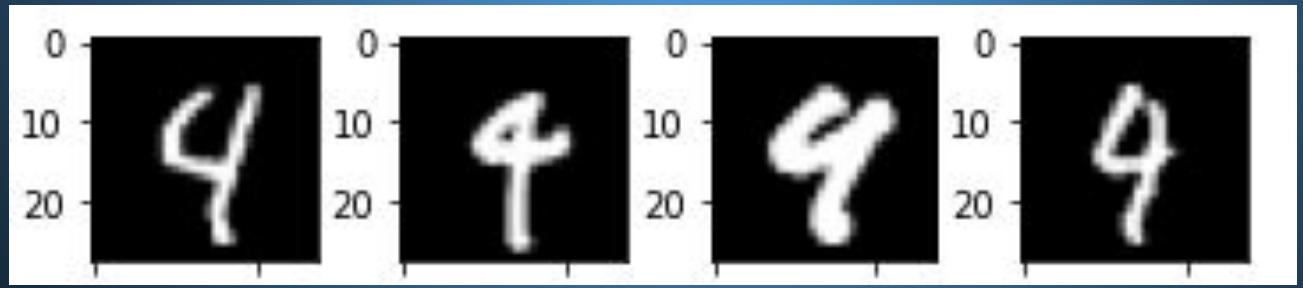


What happen with 9?

A 9 was predicted when, actually, it was a 7...



...or a 4



Why people would use our App?

- Its practicality.
- Its fast uploading due to its simplicity.
- Comfortable and useful advertisements

Why you should invest in our project?

- Its low cost due to simplicity.
- Is is expected a great amount of income from the advertisements.
- An idea based on an innovative technology.

Final remarks

- It was presented a new App to recognize handwritten phone numbers with an easy user interface
- We apply the Gaussian-Bayes algorithm and it was found an accuracy of 99% to recognize numbers
- It was presented a confusion matrix to analyse the values that went wrong during the prediction.
- There were given some arguments to proof how this app can be useful and why you should invest on it.

Appendix

Training and Test data respectively

	Unnamed: 0	index	labels	0	1	2	3	4	5	6	...	774	775	776	777	778	779	780	781	782	783
0	0	0	5	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
2	2	2	4	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
3	3	3	1	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
4	4	4	9	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0

	Unnamed: 0	index	labels	0	1	2	3	4	5	6	...	774	775	776	777	778	779	780	781	782	783
0	0	0	5	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
2	2	2	4	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
3	3	3	1	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
4	4	4	9	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0

Predictions

Test Data

	Actual	Predict
0	7	7
1	2	2
2	1	1
3	0	0
4	4	4
5	1	1
6	4	4
7	9	9
8	5	5
9	9	9

Training Data

	Actual	prediction
0	5	5
1	0	0
2	4	4
3	1	1
4	9	9
5	2	2
6	1	1
7	3	3
8	1	1
9	4	4

Confusion matrix for the Training data