Loading ...

Initiation à la Dataviz avec Python et Streamlit

Asynconf 2023, Jour 1, 30/10/2023





Avertissement

Cette présentation est volontairement écrite sur un ton qui se veut pas trop sérieux.

Comme le montre bien la slide suivante

Coucou, c'est moi

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Prof Codeur Auteur Data-tout @Kamusi









La grosse question

Qu'est-ce que la dataviz ?



C'est pour Communiquer

Communiquer avec des humains* de façon visuelle, à partir de données

Un ensemble de techniques de communication

forme/couleur /texte /structure



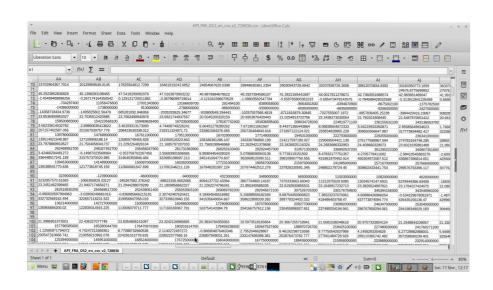
Un

n, and, angry, another, answer, any, anyone, anything, anytime, appear, apple, are, area, arm, army, around, arrive, art, as, ask, at, ttack, aunt, autumn, away, baby, base, back, bad, bag, ball, bank, basket, bath, be, bean, bear, beautiful, beer, bed, bedroom, behave, efore, begin, <u>be</u>hind, bel<u>l.</u> below, besides, best, better, between, big, bird, birth, birthda<u>v, bit, bit</u>e, black, bleed, block, blood, blow, blue parel boat boay boil, cone book border born borrow both bottle bottom bowl box bot, leanch brave rests, cridge or the Englishment Eq., brusy vuil Chira bosiness, but bosy but by, by Es, call are, careful, carefuls, carefuls, change, chang hildren, chocolate, choice, choose, circle, city, class, clever, clean, clear, climb, clock, cloth, clothes, cloud, cloudy, close, coffee, oat, coin, cold, collect, colour, comb, comfortable, common, compare, come, complete, computer, condition, continue, control, cook, ool, copper, corn, corner, correct, cost, contain, count, country, course, cover, crash, cross, cry, cup, cupboard, cut. dance, angerous, dark, daughter, day, dead, decide, decrease, deep, deer, depend, desk, destroy, develop, die, different, difficult, dinner, irection, dirty, discover, dish, direction, do, dog, door, double, down, draw, dream, dress, drink, drive, drop, dry, duck, dust, duty, each ar, early, earn, earth, east, easy, eat, education, effect, egg, eight, either, electric, elephant, else, empty, end, enemy, enjoy, enough, nter, equal, entrance, escape, even, evening, event, ever, every, everyone, exact, everybody, examination, example, except, excited, xercise, expect, expensive, explain, extremely, eye, face, fact, fail, falls, famous, far, farm, father, fast, fat, fault, fear, sed, feel, female, fever, few, fight, fill, film, find, fine, finger, finish, fire, first, fit, five, fix, flag, flat, float, floor, flour, flower, fly, fold, foor pol, foot, football, for, force, foreign, forest, forget, forgive, fork, form, fox, four, free, freedom, freeze, fresh, friend, friendly, from, front uit, full, fun, funny, furniture, further, future. game, garden, gate, general, gentleman, get, gift, give, glad, glass, go, goat, god, gold, ood, goodbye, grandfather, grandmother, grass, grave, great, green, grey, ground, group, grow, gun. hair, half, hall, hammer, hand, appen, happy, hard, hat, hate, have, he, head, healthy, hear, heavy, hello, help, heart, heaven, height, help, hen, her, here, here, hide, igh, hill, him, his, hit, hobby, hold, hole, holiday, home, hope, horse, hospital, hot, hotel, house, how, hundred, hungry, hour, hurry, usband, hurt. I, ice, idea, if, i portain, in increase, inside, into, introduce, inventoron, invite, ig island, it, its. jelly, job, join, juice, imp, just. keep, key, kill, kind ling, little kniet, knee khift, kneek know. Sider, lady varip, and lage last, late, lately, laugh, lazy, lear af, learn, leave, leg, left, land, longth, less lawor, letter, warry, harden, light, like, lich, listen, little, live, lock, lonely, long ok, lose, lot, love, low, lower, luck. machine, main, make, male, man, many, map, mark, market, marry, matter, may, me, meal, mean oise, none, nor, north, nose, not, nothing, notice, now, number. obey, object, ocean, of, off, offer, office, often, oil, old, on, one, only, pen, opposite, or, orange, order, other, our, out, outside, over, own, page, pain, pain, pain, pan, paper, parent, park, part, partner, pa ass, past, path, pay, peace, pen, pencil, people, pepper, per, perfect, period, person, petrol, photograph, piano, pick, picture, piece, pic in, pink, place, plane, plant, plastic, plate, play, please, pleased, plenty, pocket, point, poison, police, polite, pool, poor, popular, osition, possible, potato, pour, power, present, press, pretty, prevent, price, prince, prison, private, prize, probably, problem, produce, romise, proper, protect, provide, public, pull, punish, pupil, push, put. queen, question, quick, quiet, quite. radio, rain, rainy, raise, reac ead, ready, real, really, receive, record, red, remember, remind, remove, rent, repair, repeat, reply, report, rest, restaurant, result, eturn, rice, rich, ride, right, ring, rise, road, rob, rock, room, round, rubber, rude, rule, ruler, run, rush, sad, safe, sail, salt, same, sand, ave, say, school, science, scissors, search, seat, second, see, seem, sell, send, sentence, serve, seven, several, sex, shade, shado hake, shape, share, sharp, she, sheep, sheet, shelf, shine, ship, shirt, shoe, shoot, shop, short, should, shoulder, shout, show, sick, ide, signal, silence, silly, silver, similar, simple, single, since, sing, sink, sister, sit, six, size, skill, skin, skirt, sky, sleep, slip, slow, moke, small, smell, smile, smoke, snow, so, soap, sock, soft, some, someone, something, sometimes, son, soon, sorry, sound, soup, outh, space, speak, special, speed, spell, spend, spoon, sport, spread, spring, square, stamp, stand, star, start, station, stay, steal, team, step, still, stomach, stone, store, store, story, strange, street, strong, structure, student, study, stupid, subject, substance uccessful, such, sudden, sugar, suitable, summer, sun, sunny, support, sure, surprise, sweet, swim, sword, table, take, talk, tall, taste exi, tea, teach, team, tear, telephone, television, tell, ten, tennis, terrible, test, than, that, the, their, then, there, therefore, these, thick, in, thing, think, third, this, though, threat, three, tidy, tie, title, to, today, toe, together, tomorrow, tonight, too, tool, tooth, top, total, buch, town, train, tram, travel, tree, trouble, true, trust, twice, try, turn, type. uncle, under, understand, unit, until, up, use, useful, usual sually, vegetable, very, village, voice, visit, wait, wake, walk, want, warm, wash, waste, watch, water, way, we, weak, wear, weather, redding, week, weight, welcome, well, west, wet, what, wheel, when, where, which, while, white, who, why, wide, wife, wild, will, win, ind, window, wine, winter, wire, wise, wish, with, without, woman, wonder, word, work, world, worry, worst, write, wrong, year, yes,

about, above, actives, active, active, active, audi, attain, attai, ayaiti, aye, ayo, ayice, all, allolie, along, alleany, always, alli, allolii

Sans ambages

On n'est pas des machines, on ne comprend rien aux feuilles excel de x mille lignes et 150 colonnes

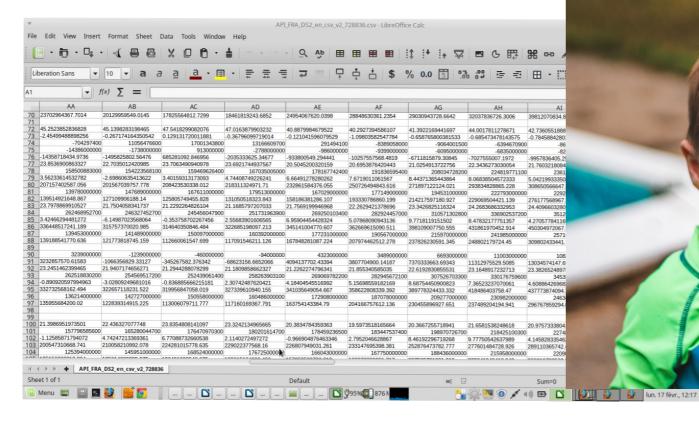




Sans ambages

On n'est pas des machines, on ne comprend rien aux

feuilles excel



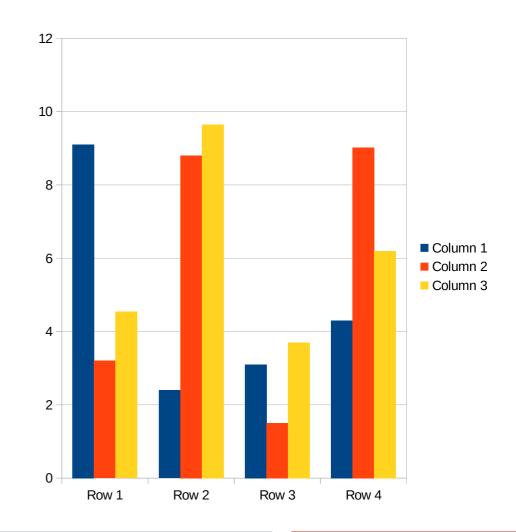
Un graphique moche mais qui a tout plein de qualités quand même

C'est une dataviz

Permet la comparaison

Légendes

Couleurs contrastées

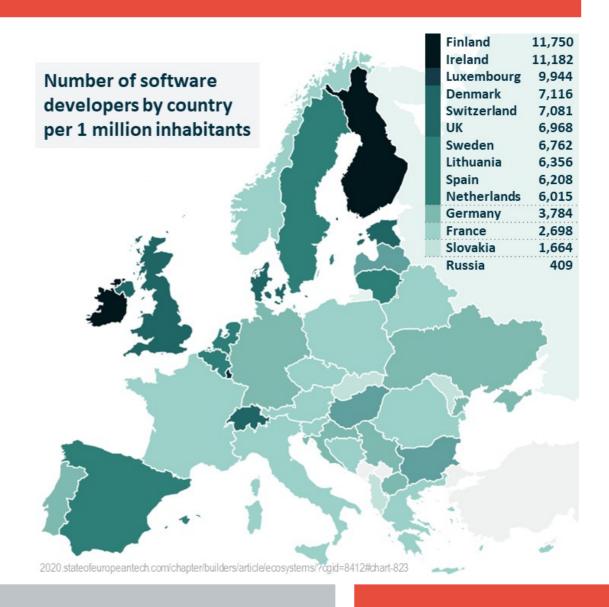


Autre dataviz

C'est vrai, j'y étais



Une dataviz réussie



Nous reviendrons ultérieurement sur comment réaliser une bonne dataviz !

Présentons les outils choisis

La grosse question 2

Pourquoi Python?

On se le demande mais c'est le choix du marché!

(pas de compilation)

Pandas



Librairie d'analyse et de manipulation de données

La référence!

https://pandas.pydata.org/

import pandas as pd
df = pd.read_csv('sirene.csv')

https://pandas.pydata.org/docs/user_guide/ 10min.html#min



Pandas + Plot.ly

La librairie Plot.ly utilise des dataframes pandas en paramètre.

Pratique!

Plot.ly a une librairie "soeur": plotly express

Qui permet de générer plus rapidement des graphiques.

Moins de paramètres. Moins de code.

La grosse question 3

Pourquoi Streamlit?

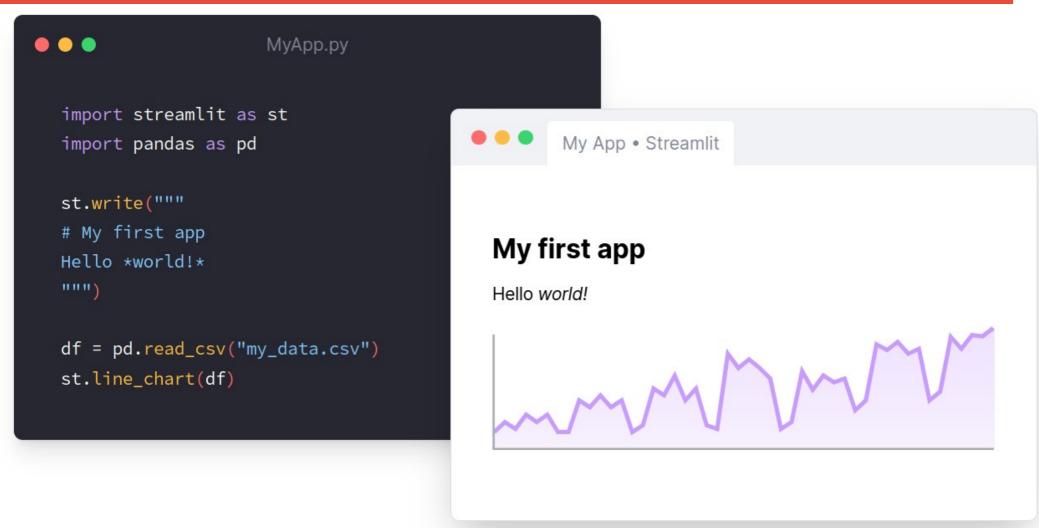
Permet de faire rapidement et simplement des tableaux décisionnels (dashboards) au format web

pip install streamlit

streamlit run MyApp.py

Moult plugins Extensible

Challenger: Dash



Quelques types de graphiques intégrés. Pas de librairie supplémentaire nécessaire

Rapidement ???

La structure d'un fichier python + streamlit :

Lister les imports

Créer un dataframe

OU Lire la data + la mettre dans un dataframe

Faire le graphique à partir du dataframe (♥ plot.ly ♥)

Afficher le graphique

Ra

Ma première appli

Afficher le graphique

import import

st.w df =

"F

"Ban

"C

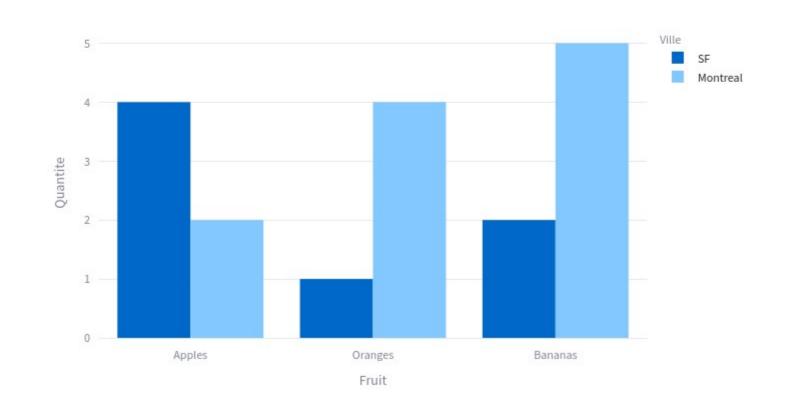
"V

})

fig =

st.w

st.w



Rapidement.py

```
import plotly.express as px
import streamlit as st
import pandas as pd
st.write("# Ma première appli") # du markdown
df = pd.DataFrame({
  "Fruit": ["Apples", "Oranges", "Bananas", "Apples", "Oranges",
"Bananas"],
  "Ouantite": [4. 1. 2. 2. 4. 5].
  "Ville": ["SF", "SF", "SF", "Montreal", "Montreal", "Montreal"]
})
fig = px.bar(df, x="Fruit", y="Quantite", color="Ville", barmode="group")
st.write("## Afficher le graphique")
st.write(fig)
```

st.write

Dataframes
Graphiques
Texte simple
Texte en Markdown



https://docs.streamlit.io/library/api-reference/write-magic/magic

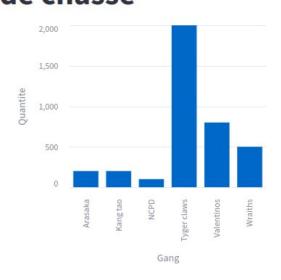
st.write

```
write(string): Markdown string, LaTeX expression, emoji
shortcodes, and colored text. See docs for st.markdown for more.
  write(data frame): Displays the DataFrame as a table.
  write(error): Prints an exception specially.
  write(func): Displays information about a function.
  write(module): Displays information about the module.
  write(class): Displays information about a class.
  write(dict): Displays dict in an interactive widget.
  write(mpl fig): Displays a Matplotlib figure.
  write(altair): Displays an Altair chart.
  write(keras): Displays a Keras model.
  write(graphviz): Displays a Graphviz graph.
  write(plotly fig): Displays a Plotly figure.
  write(bokeh fig): Displays a Bokeh figure.
  write(sympy expr): Prints SymPy expression using LaTeX.
  write(htmlable): Prints repr html () for the object if available.
  write(obj): Prints str(obj) if otherwise unknown.
```



Des colonnes! (2 niveaux max)

```
import streamlit as st
import pandas as pd
st.write("# Cyb2077 Tableau de chasse")
                                               Cyb2077 Tableau de chasse
markdown
df = pd.DataFrame({
  "Gang": ["NCPD", "Tyger claws", "Kang tao", Gang
                                                          Quantite
"Arasaka", "Valentinos", "Wraiths"],
                                                  0 NCPD
                                                            100
  "Ouantite": [100, 2000, 200, 700, 800, 500] Tyger claws
                                                           2,000
})
                                                  2 Kang tao
                                                            200
col1,col2 = st.columns(2)
                                                  3 Arasaka
                                                            200
with col1:
                                                  4 Valentinos
                                                            800
  df
                                                  5 Wraiths
with col2:
                                                            500
  st.bar chart(df,x="Gang",y="Quantite")
```



Code fourni dans le dépôt

Mais en plus ...

Appli Multi page simplissime Déploiement gratuit sur le community cloud

Streamlit ♥ Snowflake (BD SQL Cloud)

Extensible: composants supplémentaires

https://streamlit.io/components

Pygwalker, webrtc, folium

De l' IA aussi

https://streamlit.io/generative-ai

Résumons

Pour faire de la dataviz

Il vous faut:



Un langage

- + Une librairie de charting
- + Un moyen de présenter les graphiques

Pour faire une bonne dataviz

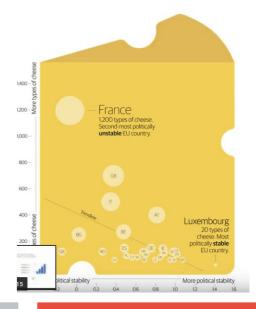
Du temps

Un type adapté
Un titre
Des couleurs qui parlent
Des unités, des échelles
Un § explicatif

Bonus: un fond qui correspond au sujet



Thermostat 6*7



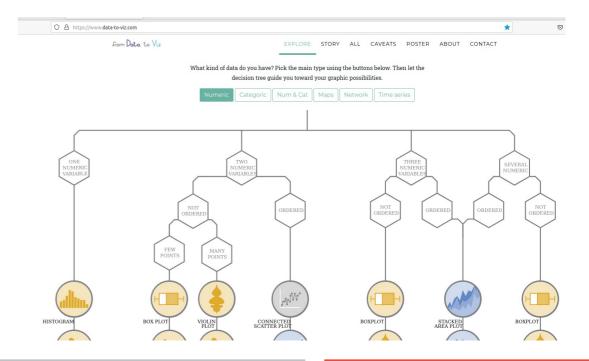
Choisir le type

Il y a un graphique pour choisir quel graphique utiliser.

https://www.data-to-viz.com/

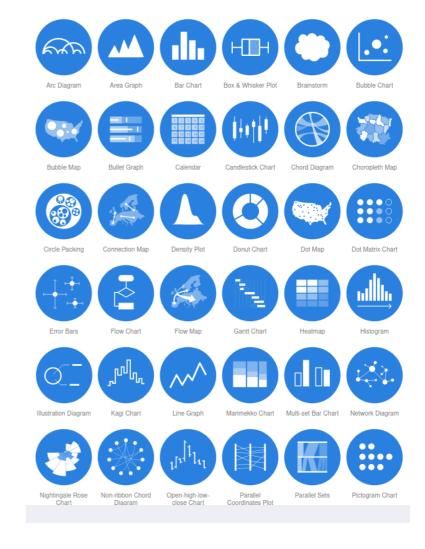
Avec des codes d'exemple

R, React, D3, Python



Comprendre les types de charts

https://datavizcatalogue.com/



C'est du bon sens!

Un titre

Qui explique de quoi parle votre camembert de couleur

Des couleurs qui parlent

La pollution, en rose vraiment?

Des unités, des échelles

Surtout si plusieurs graphiques en un

Un § explicatif

Le lecteur peut chercher une explication, une confirmation, on peut aussi y prévenir que les données correspondent à une période

Dans ma hotte

https://github.com/wadael/asynconf_dtvz

Les slides Les slides en + Les codes

Démos (codes fournis)

Exemple simple (rapidement.py)

Les ventes de jeux vidéo

Les stations de la SNCF

Les tournages à Paris

Galerie

https://streamlit.io/gallery

Applications en ligne, au code publié. Autant de documentation :)

Crédits photos

https://www.abandonware-france.org/bibliotheque/magazines/tilt-1/numero-21-7682/

https://www.cineserie.com/news/cinema/didier-linterview-bouleversante-dalain-chabat-en-memoire-de-jean-pierre-bacri-5692073/

https://mag.starterre.fr/guide-astuce-automobiliste/comment-faire-un-creneau.html

https://imgflip.com/memegenerator

https://upload.wikimedia.org/wikipedia/commons/0/05/Disgust_by_the_pool.jpg https://fr.wikipedia.org/wiki/Amstrad_CPC_6128#/media/Fichier:Amstrad_CPC_6128.jpg

https://www.lg.com/fr/moniteurs/lg-49wl95cp-w-moniteur-ultrawide

https://www.etsy.com/de-en/listing/1291416971/banksy-panda-lithograph-certificate

https://queenfansclub.com/discografia/a-kind-of-magic/

https://www.radiofrance.fr/franceculture/le-temps-des-archives-la-cuisine-a-la-tele-3272224

https://www.sudouest.fr/culture/programmes-tv/television-depuis-les-annees-1950-les-emissions-culinaires-faconnent-l-image-des-chefs-11289654.php

http://apprentissieres.canalblog.com/albums/1 apprentie touriere/photos/17163730-enfourner des croissants.html

https://inapps.net/wp-content/uploads/2022/01/software-developer-in-europe.jpg

https://lesavaistu.fr/wp-content/uploads/2015/10/Mettre-les-pieds-dans-le-plat-1200x895.jpg

Merci

Et que Streamlit soit une nouvelle corde à votre arc!



Contact



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https://www.linkedin.com/in/jeromebaton/

www.kamusi.org

https://github.com/wadael/asynconf dtvz