WebApps Development

Using Streamlit Library in Python

POLITEKNIK AKA BOGOR

Terdepan dalam Terapan Analisis Kimia

Delivered by

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https://www.linkedin.com/in/nandafadhli93/

About Me

PERSONAL DETAILS

D.O.B — Padang, May 6th, 1993

Location — Depok, Jawa Barat

EDUCATION BACKGROUND

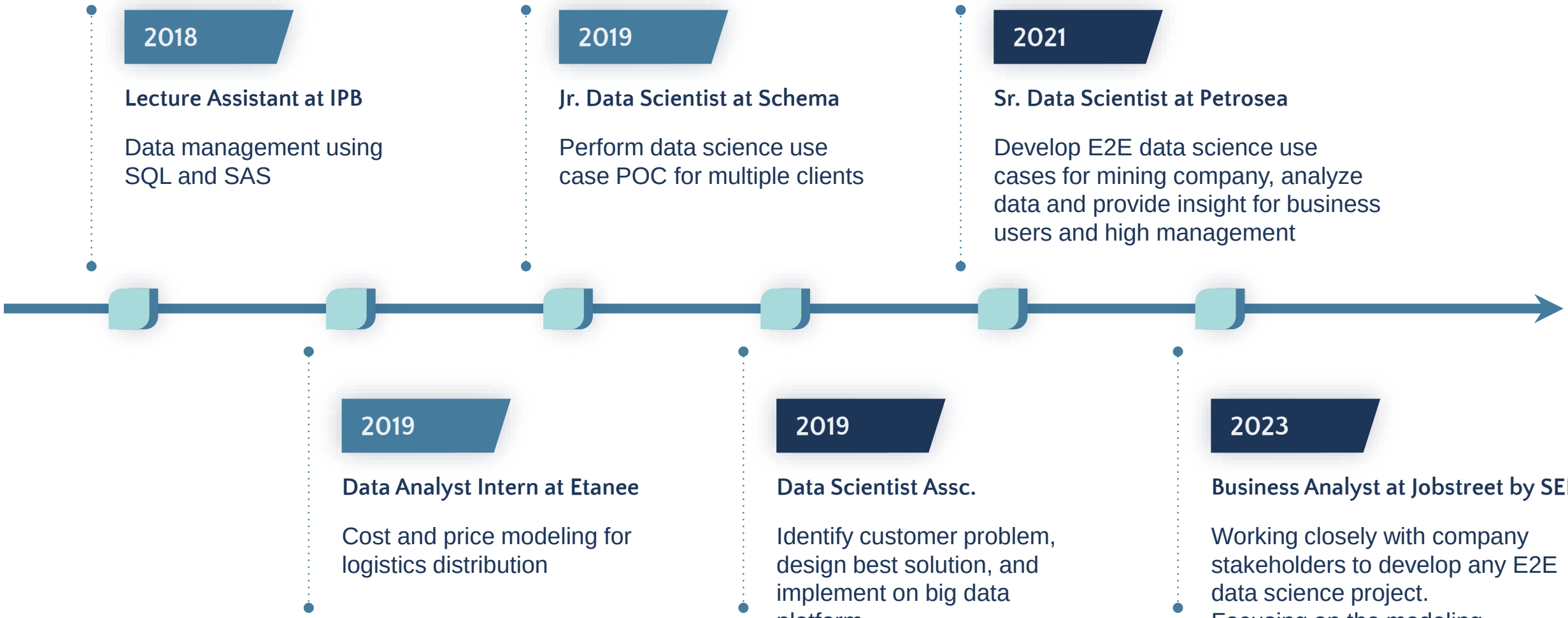
University: IPB University (2017-2019)
Master in Applied Statistics.
GPA 3.96 / 4.0

- Statistical theory and analysis
- Supervised learning
- Unsupervised learning
- Feature engineering technique
- Experimental design
- Data management and visualization technique
- R, Python, SQL, and SAS programming

University: State University of Padang (2011-2016)
Bachelor in Mathematics Education. GPA 3.52 / 4.0

- Basic and advanced calculus
- Linear and abstract algebra
- Algorithm and programming (turbo pascal)
- Geometry and trigonometry
- Elementary and mathematical statistics
- Real analysis
- Pedagogic science

Work Experiences



Today’s Outline

Concept

Peserta dapat memahami konsep, implementasi streamlit di industri

Practice

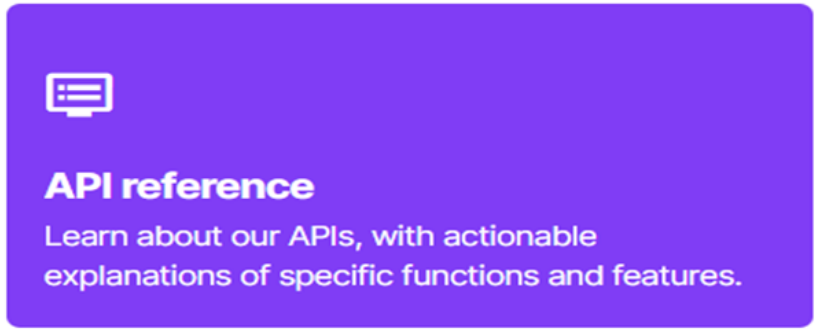
Peserta dapat mempraktikkan code-code dalam library streamlit untuk membuat sebuah web apps

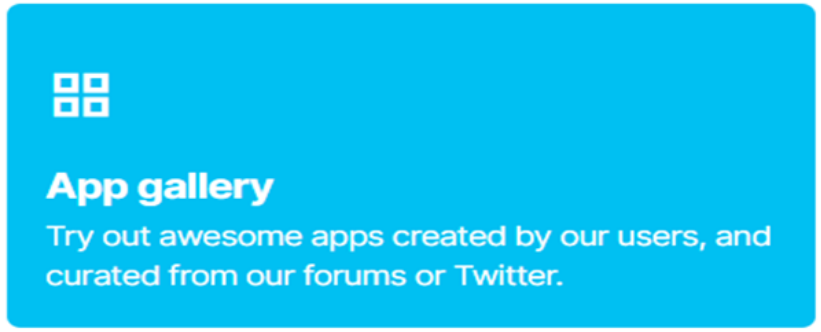
Deployment

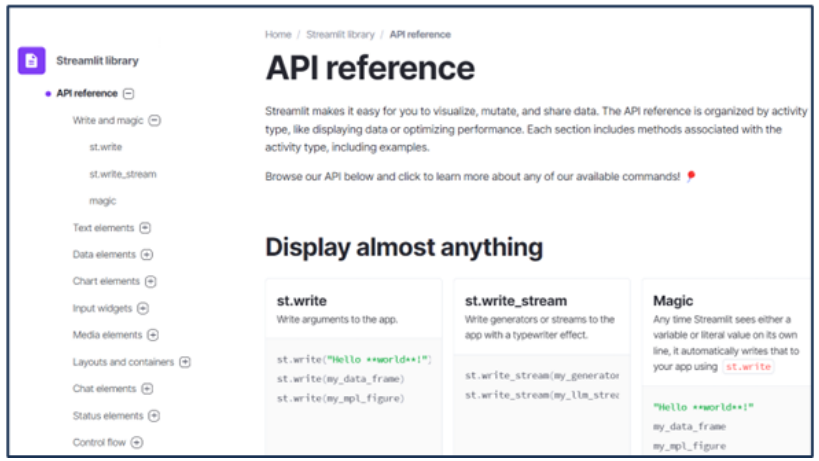
Peserta dapat melakukan deployment ke streamlit cloud sehingga aplikasi dapat digunakan publik

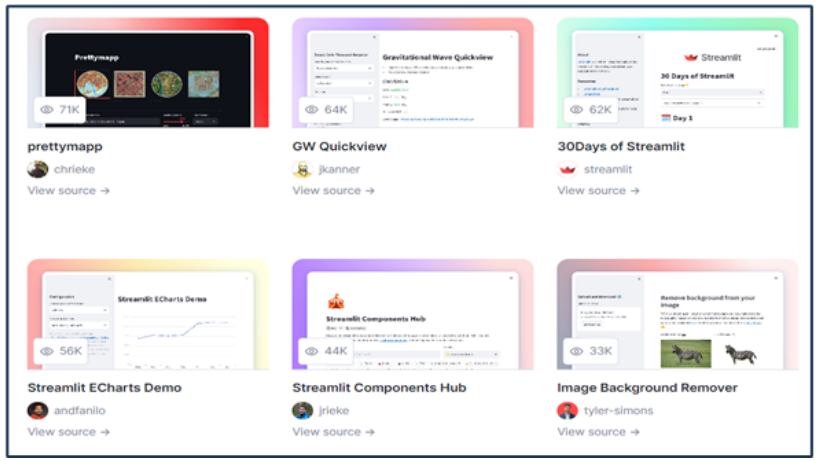
Introduction to Streamlit

Streamlit adalah sebuah library Python (open source) yang memudahkan pengguna untuk membuat dan berbagi aplikasi custom berbasis web untuk Artificial Intelligence (A.I), Data Science, dan Data Analytics. Dalam beberapa menit saja, pengguna dapat membangun dan mendeploy aplikasi data yang powerful.









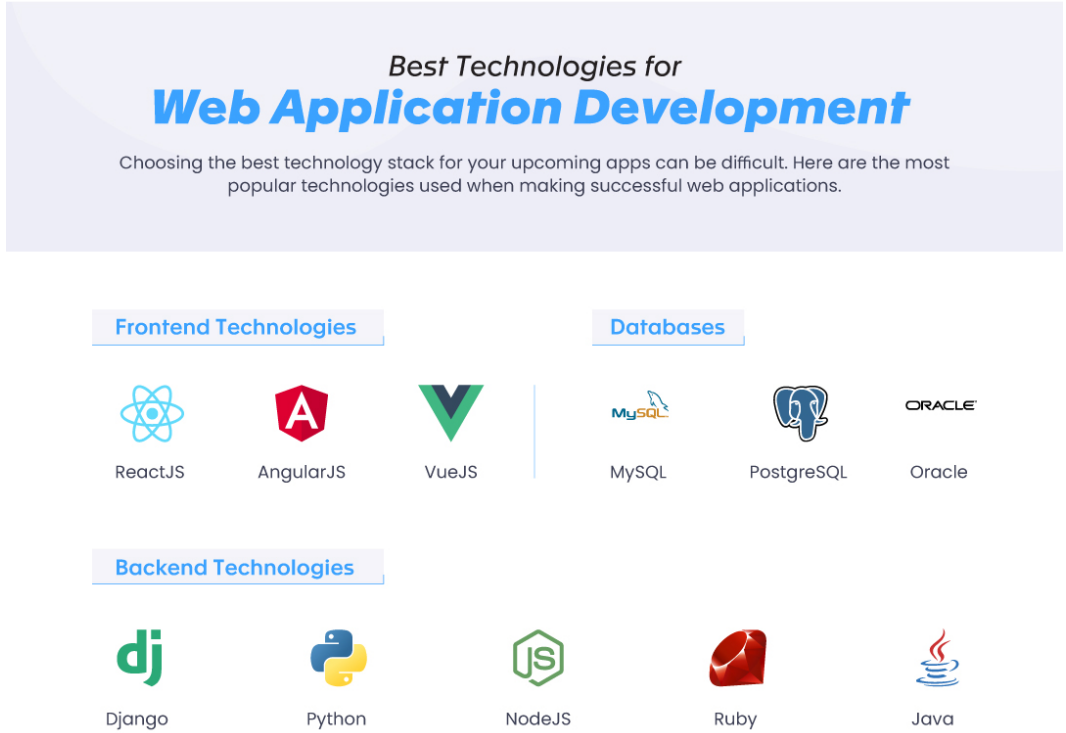
Terdapat dua sumber yang bisa digunakan dalam membuat webapps dengan streamlit

1. API reference
2. App Gallery

Streamlit documentation

Bagaimana sebuah Apps bekerja?

Sebuah aplikasi terdiri dari tiga bagian utama: front end, back end, dan database. Front end adalah bagian yang terlihat oleh pengguna, seperti tata letak dan interaksi. Back end adalah bagian yang tidak terlihat, mengelola logika dan fungsionalitas di belakang layar. Database menyimpan data yang digunakan oleh website, seperti informasi pengguna. Ketiganya bekerja sama untuk menyajikan informasi kepada pengguna, mengelola interaksi, dan menyimpan data.



Beberapa referensi tools utk web development

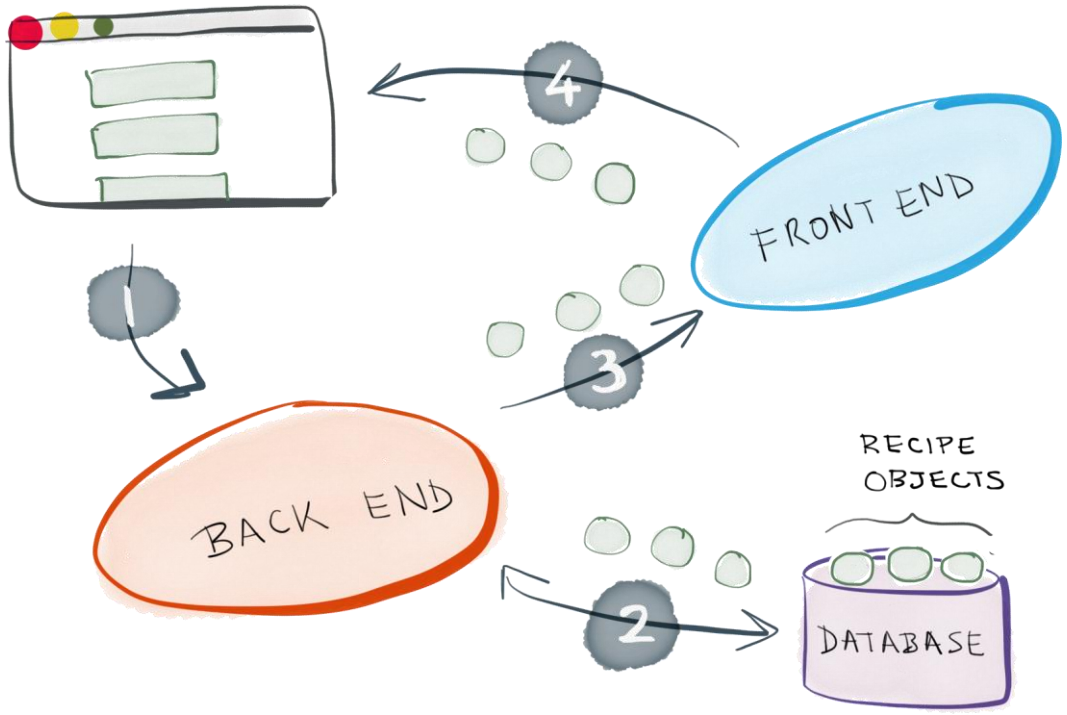
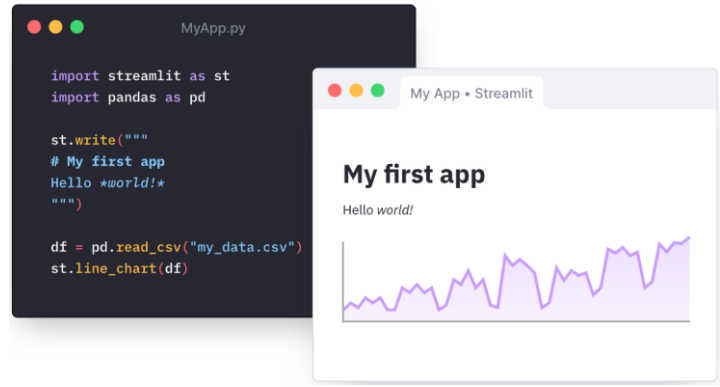


Diagram flow web app development

Tiga Prinsip Dasar Streamlit

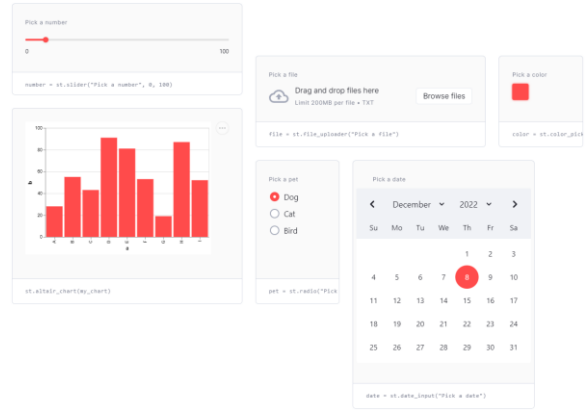
1. Embrace scripting

Build an app in a few lines of code with our **magically simple API**. Then see it automatically update as you iteratively save the source file.



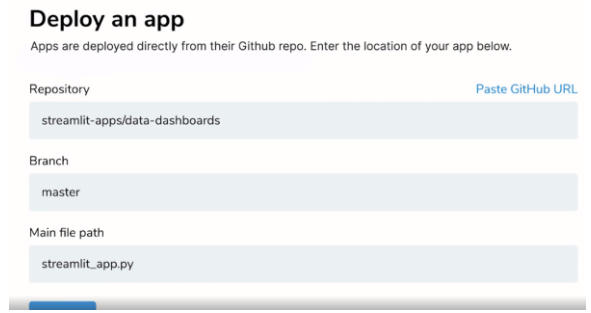
2. Weave in interaction

Adding a widget is the same as **declaring a variable**. No need to write a backend, define routes, handle HTTP requests, connect a frontend, write HTML, CSS, JavaScript, ...



3. Deploy instantly

Effortlessly share, manage and deploy your apps, directly from Streamlit. **All for free!**



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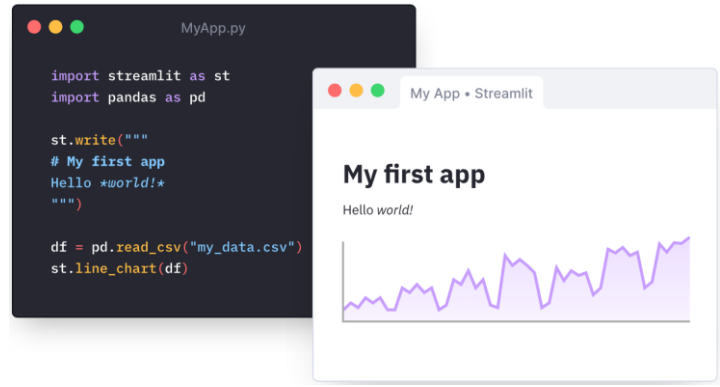

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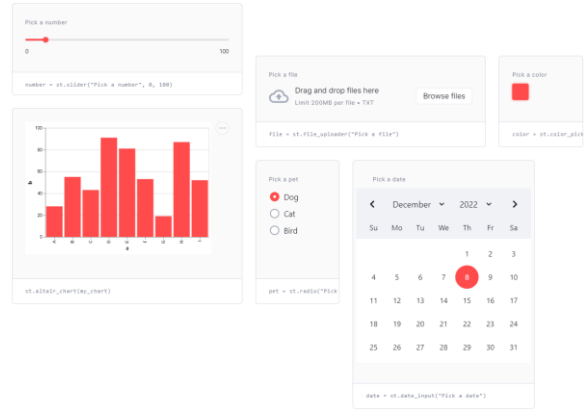

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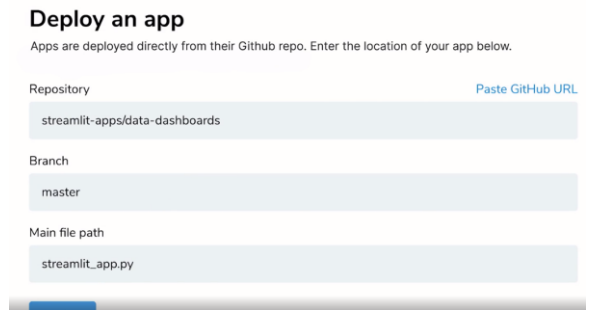
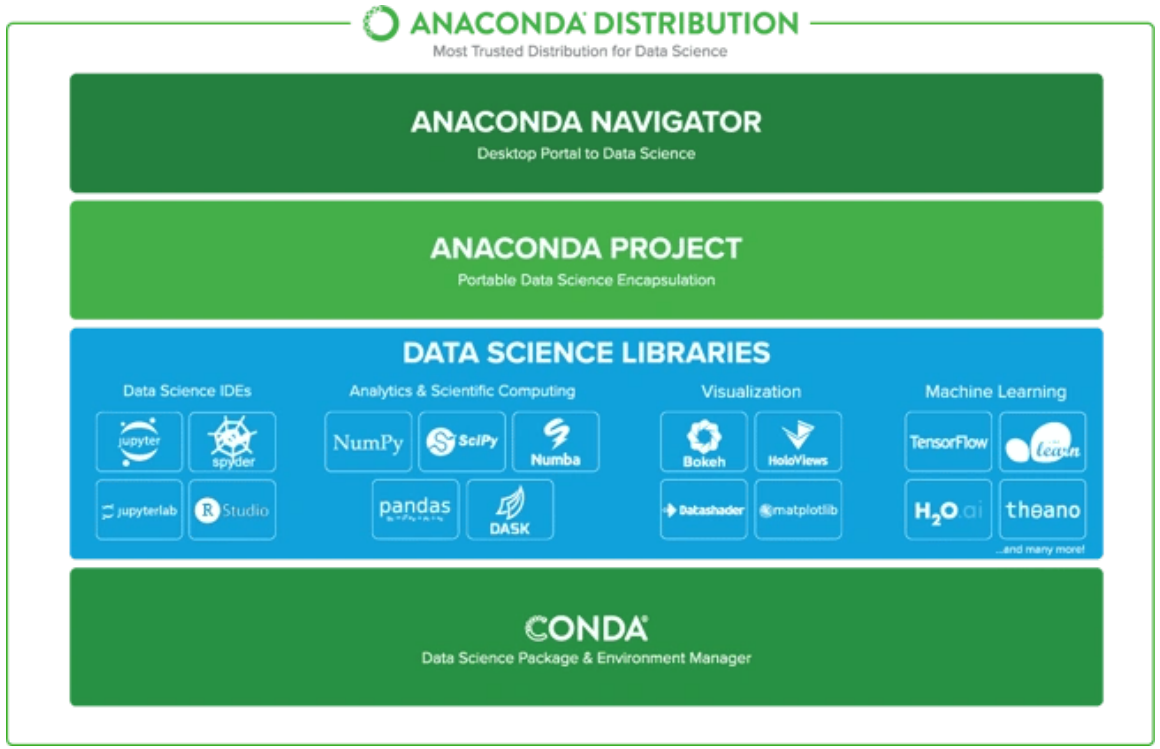


Dimana Streamlit bisa dijalankan?



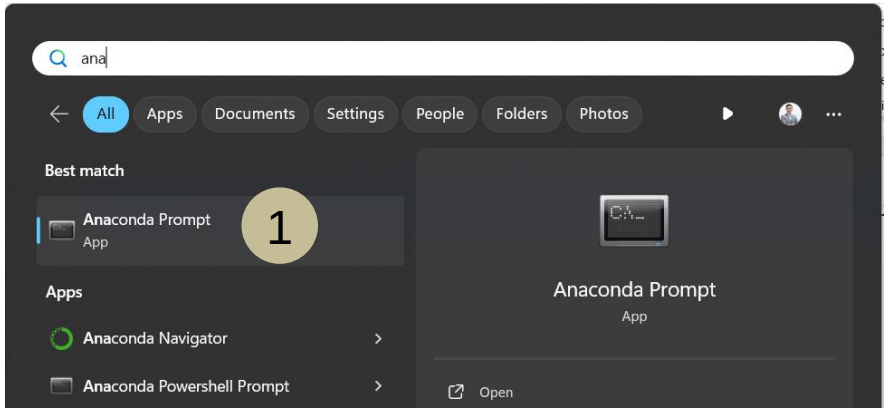
Anaconda Software

Visual Studio Code

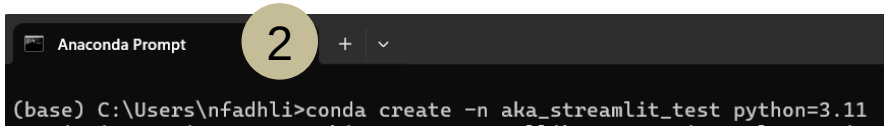
Library **Streamlit** adalah salah **satu dari ribuan library** yang available di software open-source Anaconda. Sementara itu, untuk mendapatkan experience yang optimal, **kombinasi Visual Studio Code dan Anaconda adalah tools yang sangat powerful**

Bagaimana Cara Membuat Environment baru di Anaconda?

- Klik Menu **Start pada Windows,** ketik “anaconda prompt”, klik pada icon no (1)



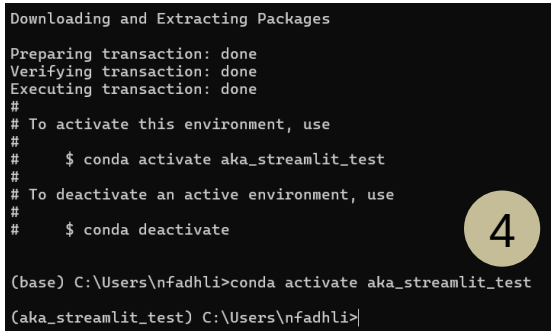
- Jika sudah muncul dialog box anaconda prompt (2), maka ketik code berikut
  conda create -n nama_env_yang_diinginkan python=3.11



Jika kamu sudah berhasil aktifasi environment, maka tulisan “(base)” akan berubah menjadi “(nama_env_yang_sudah_dibuat)” sesuai pada contoh icon no (5)

- Setelah running sintaks pada point (2), maka proses akan berjalan sampai dengan berhenti pada icon no (3), maka ketik “y” (tanpa tanda petik, sesuai gambar) untuk melanjutkan instalasi

- Jika proses selesai maka output akan seperti gambar berikut. Kemudian untuk aktifasi environtmentnya, maka ketik pada icon no (4) conda activate nama_env_yang_sudah_dibuat



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Bagaimana Cara Install Library Streamlit?

- Jika kamu sudah berhasil di step no (5) : “aktifasi environment”. Maka kamu bisa lanjutkan untuk install streamlit, gunakan code: pip install streamlit dan ketik pada icon no (6), sehingga proses instalasinya berjalan (proses ini cukup memakan waktu tergantung pada kecepatan processor laptop kamu

```
(aka_streamlit_test) C:\Users\nfadhli>pip install streamlit
Collecting streamlit
  Downloading streamlit-1.32.2-py2.py3-none-any.whl.metadata (8.5 kB)
Collecting altair<6,>=4.0 (from streamlit)
  Downloading altair-5.2.0-py3-none-any.whl.metadata (8.7 kB)
Collecting blinker<2,>=1.0.0 (from streamlit)
  Downloading blinker-1.7.0-py3-none-any.whl.metadata (1.9 kB)
Collecting cachetools<6,>=4.0 (from streamlit)
  Downloading cachetools-5.3.3-py3-none-any.whl.metadata (5.3 kB)
Collecting click<9,>=7.0 (from streamlit)
  Downloading click-8.1.7-py3-none-any.whl.metadata (3.0 kB)
Collecting numpy<2,>=1.19.3 (from streamlit)
  Downloading numpy-1.26.4-cp311-cp311-win_amd64.whl.metadata (61 kB)
     ---------------------------------------- 61.0/61.0 kB 162.3 kB/s eta 0:00:00
```

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- Jika proses instalasinya sudah selesai, maka outputnya akan seperti berikut, terlihat tulisan “successful” seperti pada panah **merah .** Selanjutnya untuk memastikan streamlit sudah bisa digunakan. Ketik streamlit hello pada icon no (7) sehingga muncul output seperti dibawah ini **(gambar kiri: output dengan tulisan “Welcome to Streamlit”, gambar kanan: browser yang terbuka secara otomatis)**

```
Downloading colorama-0.4.6-py2.py3-none-any.whl (25 kB)
Downloading toolz-0.12.1-py3-none-any.whl (56 kB)
     ---------------------------------------- 56.1/56.1 kB 493.3 kB/s eta 0:00:00
Downloading MarkupSafe-2.1.5-cp311-cp311-win_amd64.whl (17 kB)
Downloading mdurl-0.1.2-py3-none-any.whl (10.0 kB)
Downloading six-1.16.0-py2.py3-none-any.whl (11 kB)
Downloading smmap-5.0.1-py3-none-any.whl (24 kB)
Installing collected packages: pytz, watchdog, urllib3, tzdata, typing-extensions, tornado, toolz, toml, tenacity, smmap, six, pygments, protobu
f, pillow, packaging, numpy, mdurl, MarkupSafe, idna, colorama, charset-normalizer, certifi, cachetools, blinker, requests, python-dateutil, pya
rrow, markdown-it-py, jinja2, gitdb, click, rich, pydeck, pandas, gitpython, altair, streamlit
Successfully installed MarkupSafe-2.1.5 altair-5.2.0 blinker-1.7.0 cachetools-5.3.3 certifi-2024.2.2 charset-normalizer-3.3.2 click-8.1.7 colora
ma-0.4.6 gitdb-4.0.11 gitpython-3.1.42 idna-3.6 jinja2-3.1.3 markdown-it-py-3.0.0 mdurl-0.1.2 numpy-1.26.4 packaging-23.2 pandas-2.2.1 pillow-10
.2.0 protobuf-4.25.3 pyarrow-15.0.2 pydeck-0.8.1b0 pygments-2.17.2 python-dateutil-2.9.0.post0 pytz-2024.1 requests-2.31.0 rich-13.7.1 six-1.16.
0 smmap-5.0.1 streamlit-1.32.2 tenacity-8.2.3 toml-0.10.2 toolz-0.12.1 tornado-6.4 typing-extensions-4.10.0 tzdata-2024.1 urllib3-2.2.1 watchdog
-4.0.0

(aka_streamlit_test) C:\Users\nfadhli>streamlit hello

      Welcome to Streamlit!

      If you'd like to receive helpful onboarding emails, news, offers, promotions,
      and the occasional swag, please enter your email address below. Otherwise,
      leave this field blank.

      Email:

  You can find our privacy policy at https://streamlit.io/privacy-policy

  Summary:
  - This open source library collects usage statistics.
  - We cannot see and do not store information contained inside Streamlit apps,
    such as text, charts, images, etc.
  - Telemetry data is stored in servers in the United States.
  - If you'd like to opt out, add the following to %userprofile%/.streamlit/config.toml,
```

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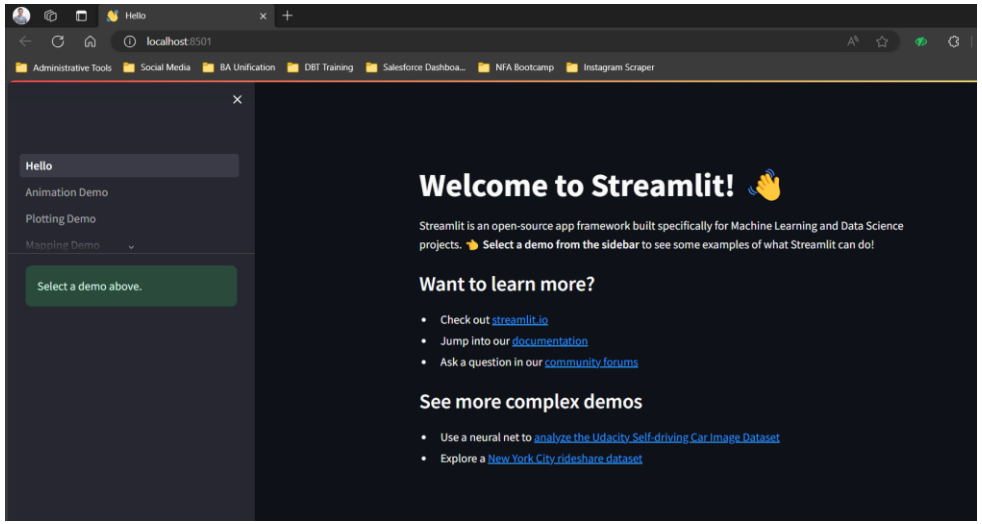

Streamlit Hands-On

Klik link berikut untuk source code detail https://docs.streamlit.io/library/api-reference

Write & Text	• e.g.: Title, Header, Subheader
Data Display	• e.g.: dataframe, table, metrics
Chart	• e.g.: line_chart, bar_chart, plotly
Input	• e.g.: button, slider, number/text input
Media	• e.g.: image, audio, video
Layout & Container	• e.g.: sidebar, column, tabs
Status	• e.g.: progress, error, warnings, success

Deployment ke Streamlit Cloud

https://www.youtube.com/watch?v=teOcYWs-qOk