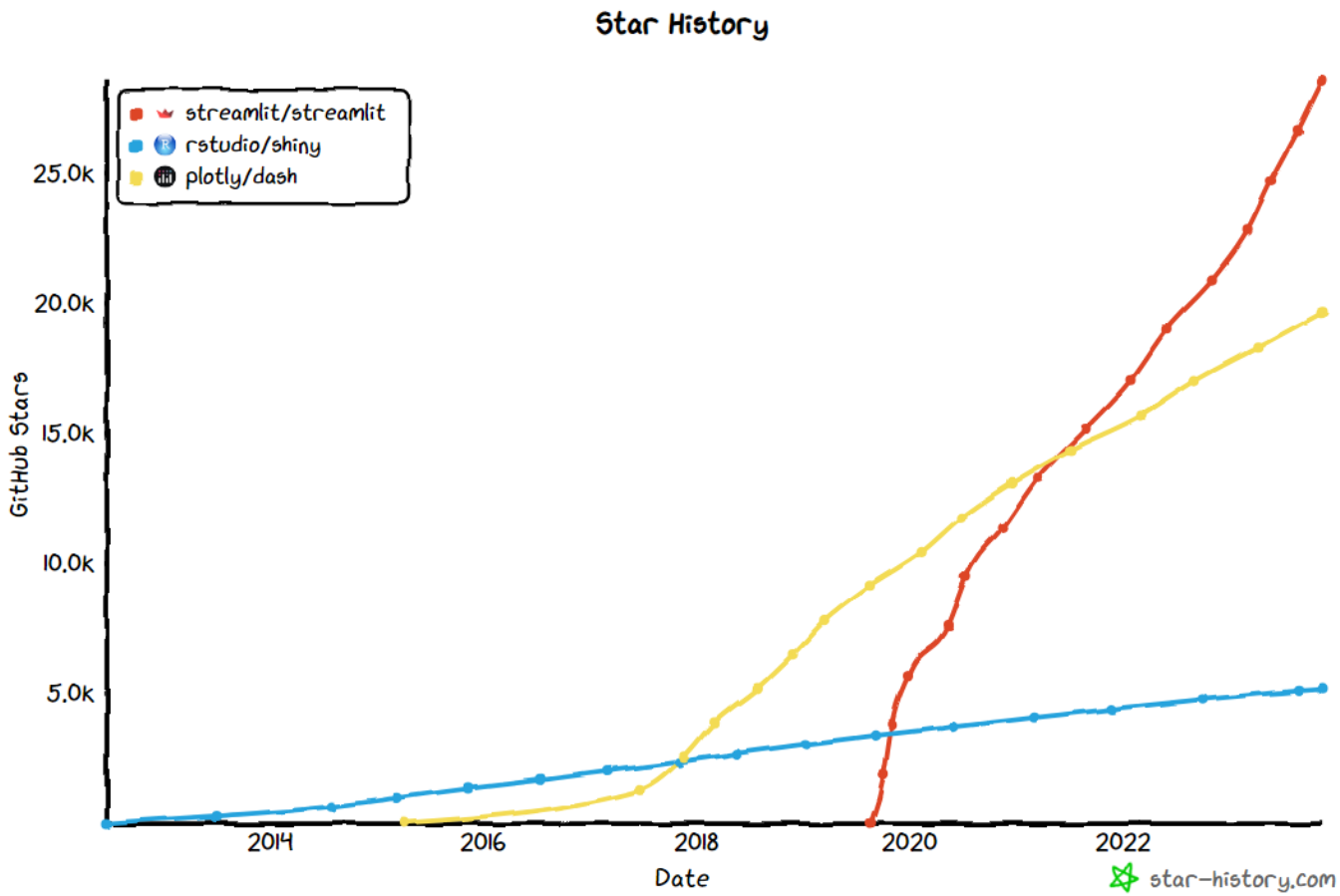
Streamlit

with  python™

01. Popularity

◆ Release

✓ 2019년 10월, 가장 빠르게 성장하는 Dashboard 프레임워크



02. Streamlit 탄생 스토리

◆ Streamlit 처음 설계한 창업자

- **CEO of Streamlit**
- **2022년 3월, Snowflake와 합병**
- **Computer Science Prof. at Carnegie Mellon**
- **Google X Project, VP at Zoox**

03. Streamlit 탄생 스토리

◆ Streamlit 처음 설계한 창업자

What if we could make building tools as easy as writing Python scripts?

"Adrien Treuille"

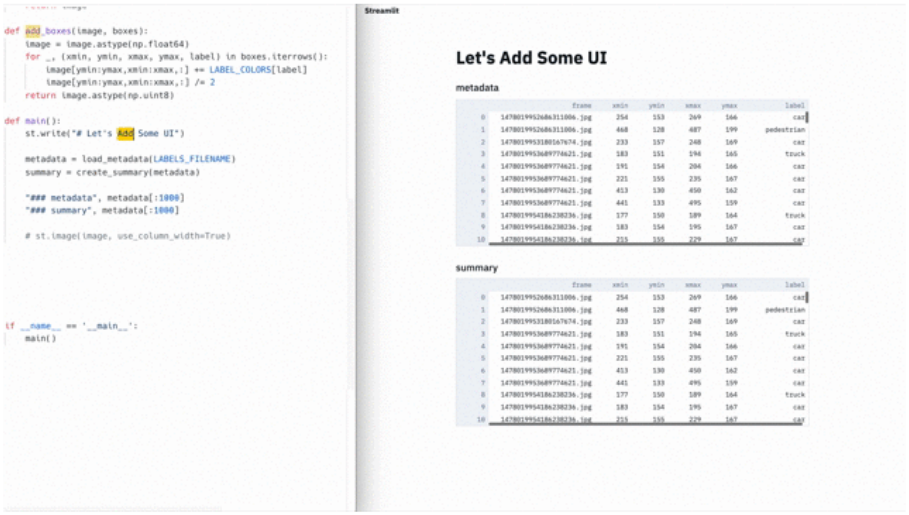
03. Streamlit 탄생 스토리

Adrien Treuille

Oct 1, 2019 · 7 min read · Member-only · Listen

Turn Python Scripts into Beautiful ML Tools

Introducing Streamlit, an app framework built for ML engineers



Coding a semantic search engine with real-time neural-net inference in 300 lines of Python.

In my experience, every nontrivial machine learning project is eventually stitched together with bug-ridden and unmaintainable internal tools. These tools — often a patchwork of Jupyter Notebooks and Flask apps — are difficult to deploy, require reasoning about client-server architecture, and don't integrate well with machine learning constructs like Tensorflow GPU sessions.

Adrien Treuille

2.1K Followers

Adrien is co-founder of Streamlit, the ML tooling framework. Adrien was a computer science prof at Carnegie Mellon, lead a Google X project, and was VP at Zoox.

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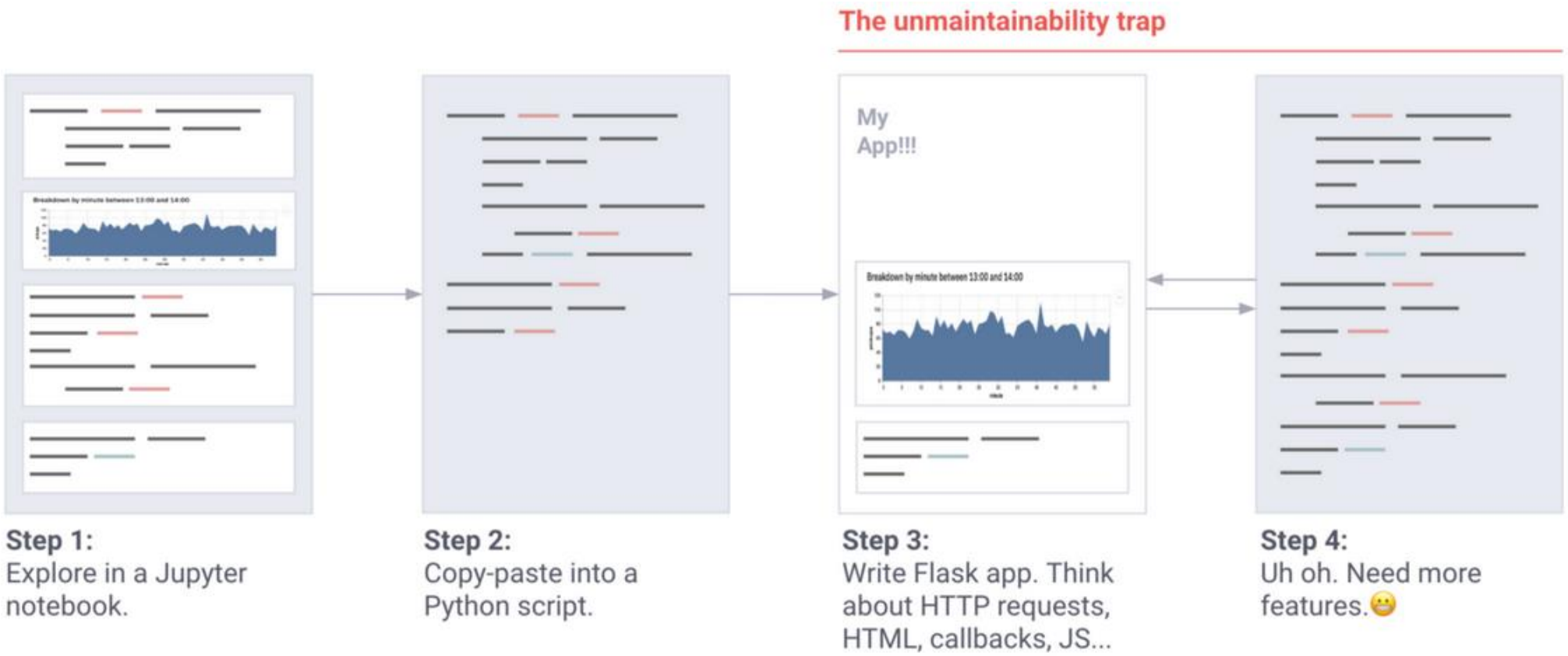
Release

- 2019년 10월 1일

03. Streamlit 탄생 스토리

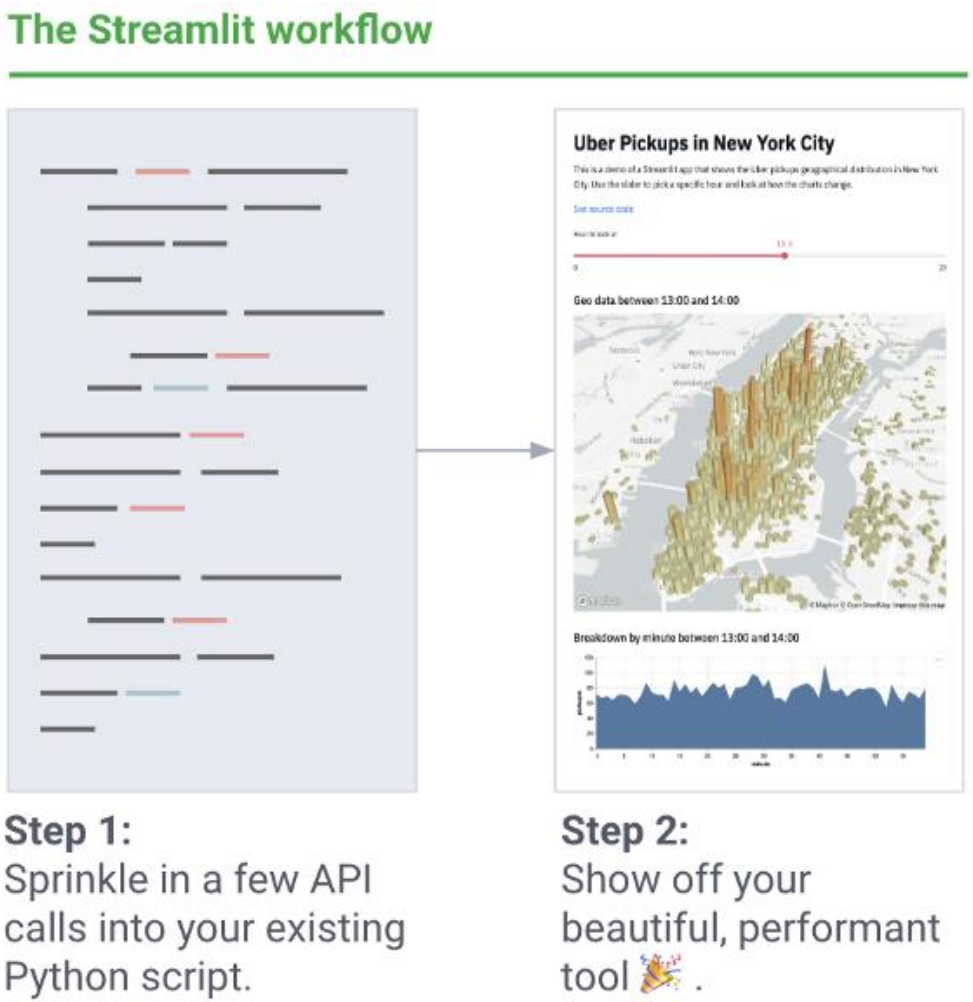
◆ 머신러닝 엔지니어의 가장 큰 문제점 (2019년 이전)

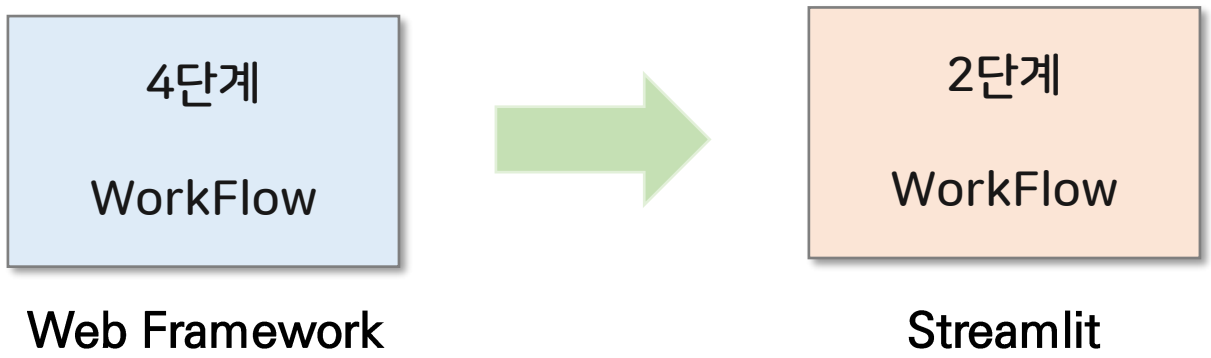


< The machine learning engineers' ad-hoc app building flow >

03. Streamlit 탄생 스토리

◆ Streamlit WorkFlow





04. Rules

◆ Scripting Workflow

✓ Coding just like on Google Colab or Jupyter Notebook For Data Analyst

기본 원칙	코드 예시
Embrace Python Scripting	>>> import streamlit as st >>> st.write('Hello, World!')

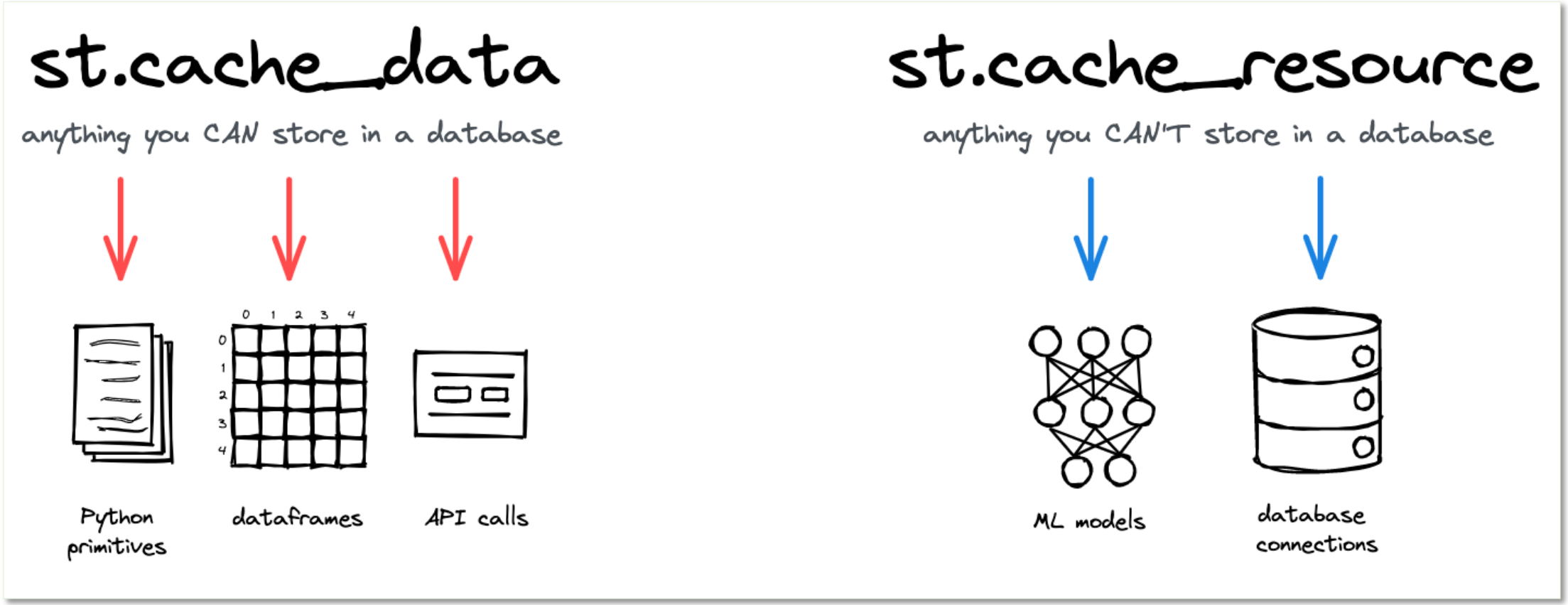
Treat widgets as variables	>>> import streamlit as st
	>>> x = st.slider('x')
	>>> st.write(x, 'squared is', x * x)

Reuse Data and Computation
Key : Cache (Persistent, Immutable by default)
	>>> import streamlit as st
	>>> import pandas as pd
	>>> data = pd.read_csv('iris.csv')
	>>> st.dataframe(data)

04. Rules

◆ Advanced Features Cache

✓ Just call long-running functions once and save it into session



04. Rules

◆ Advanced Features Cache

✓ 동일한 연산을 여러 번 수행하지 않아도 사용자 상호 작용이 빨라지고 웹 성능이 향상됨

✓ st.cache_data vs st.cache_resource

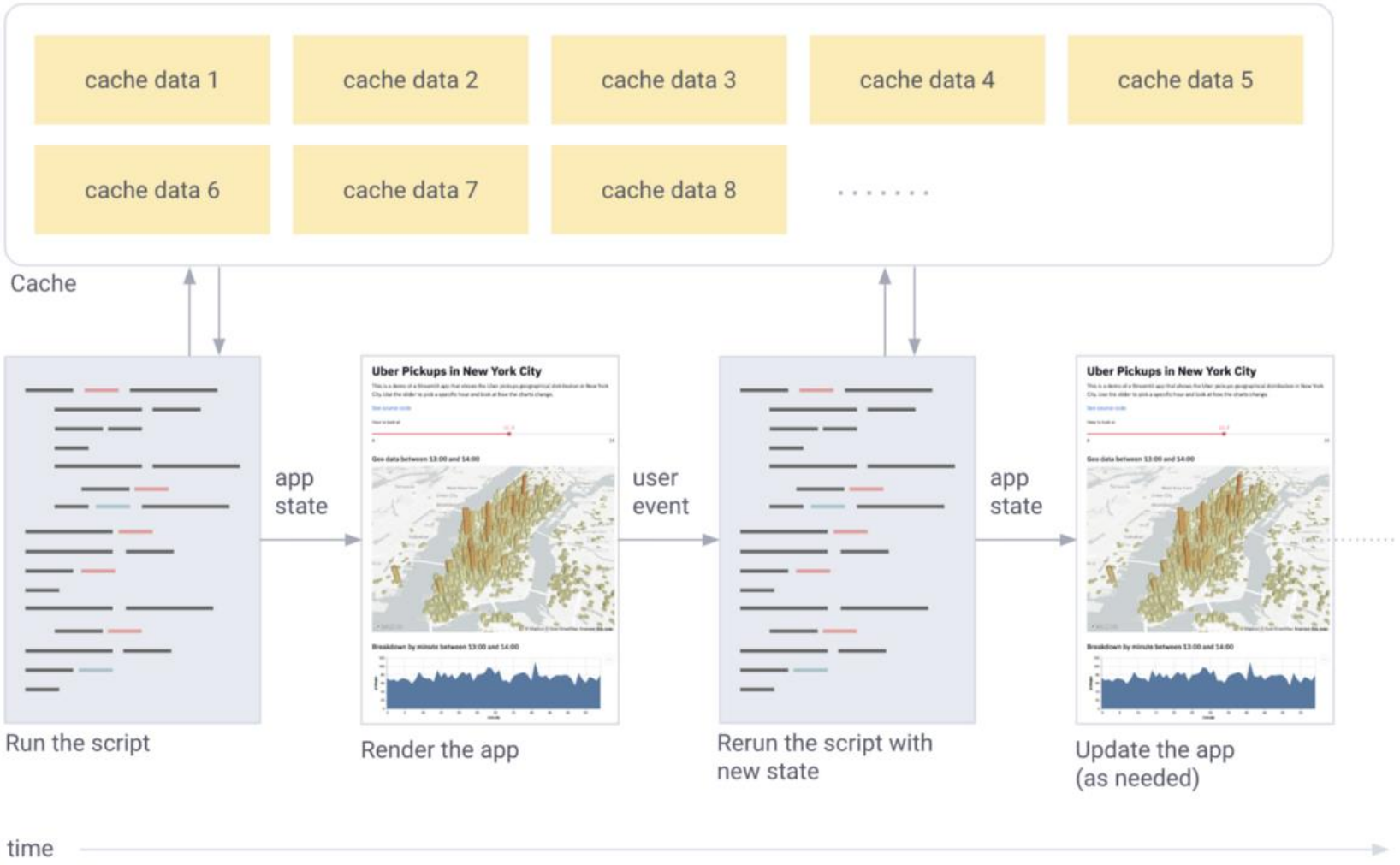
@st.cache_data	@st.cache_resource
✓ CSV 파일 불러오기 ✓ API 호출 ✓ NumPy 배열 변환 ✓ str, DataFrame, List 등이 함수 반환값	✓ ML Models or Database Connections

a serializable data object

unserializable objects

05. Cache Data

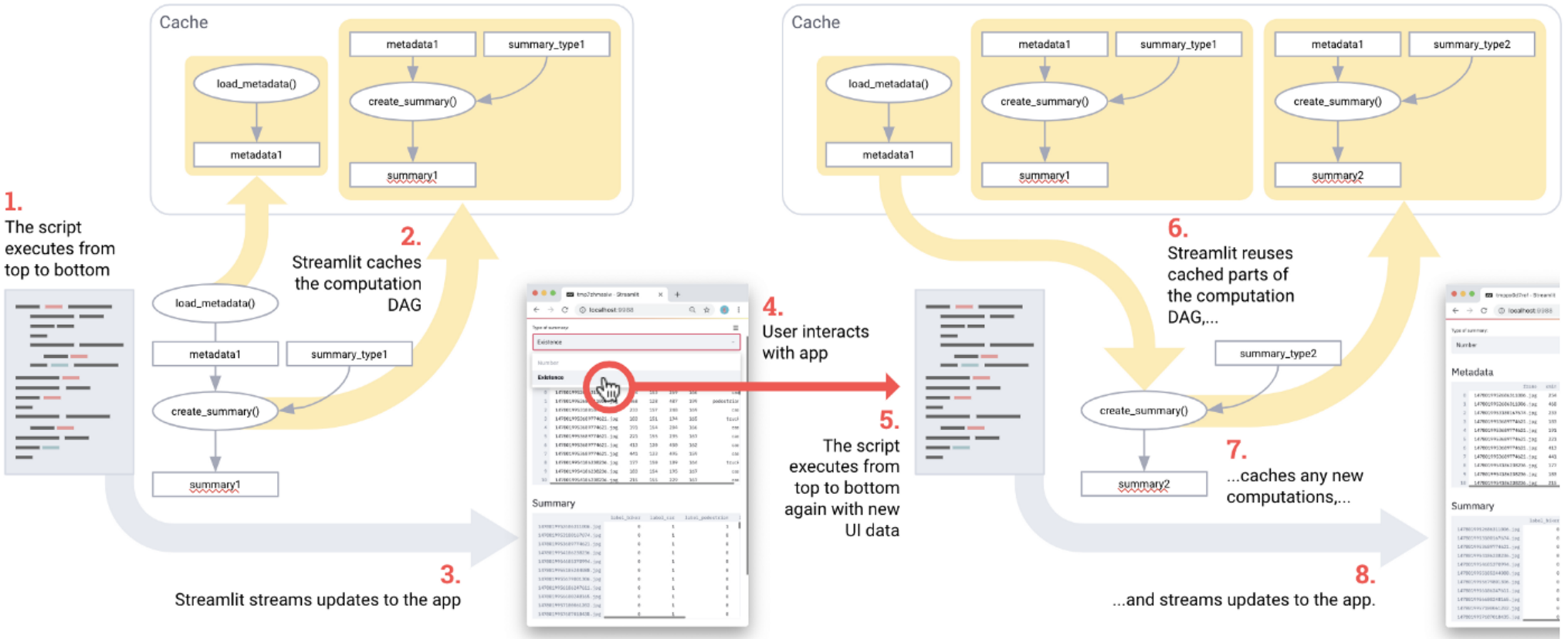
◆ Persisting across Running App



05. Cache Data

◆ Persisting across Running App

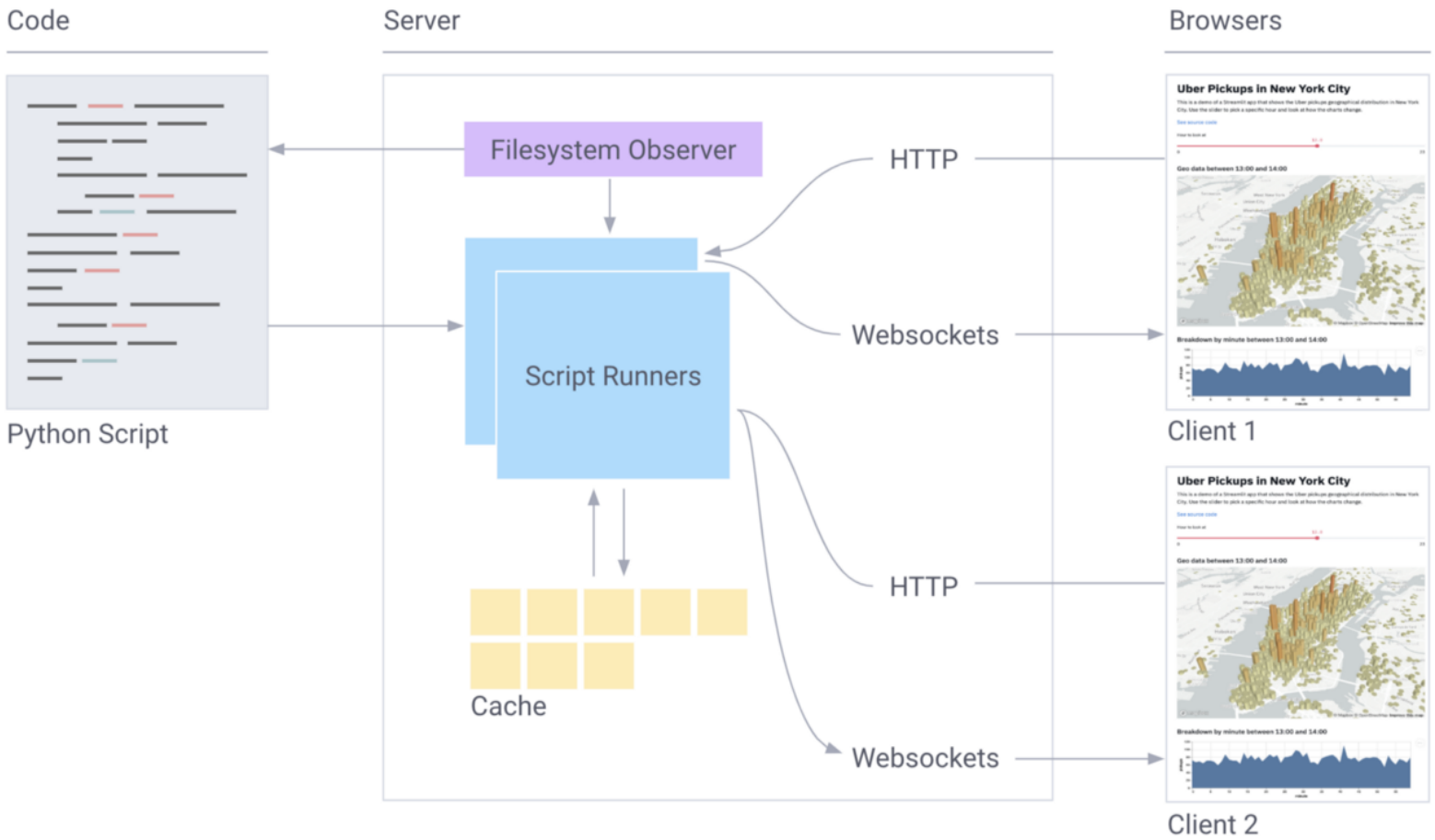
✓ UI가 변경될 때만, recomputing이 발생함



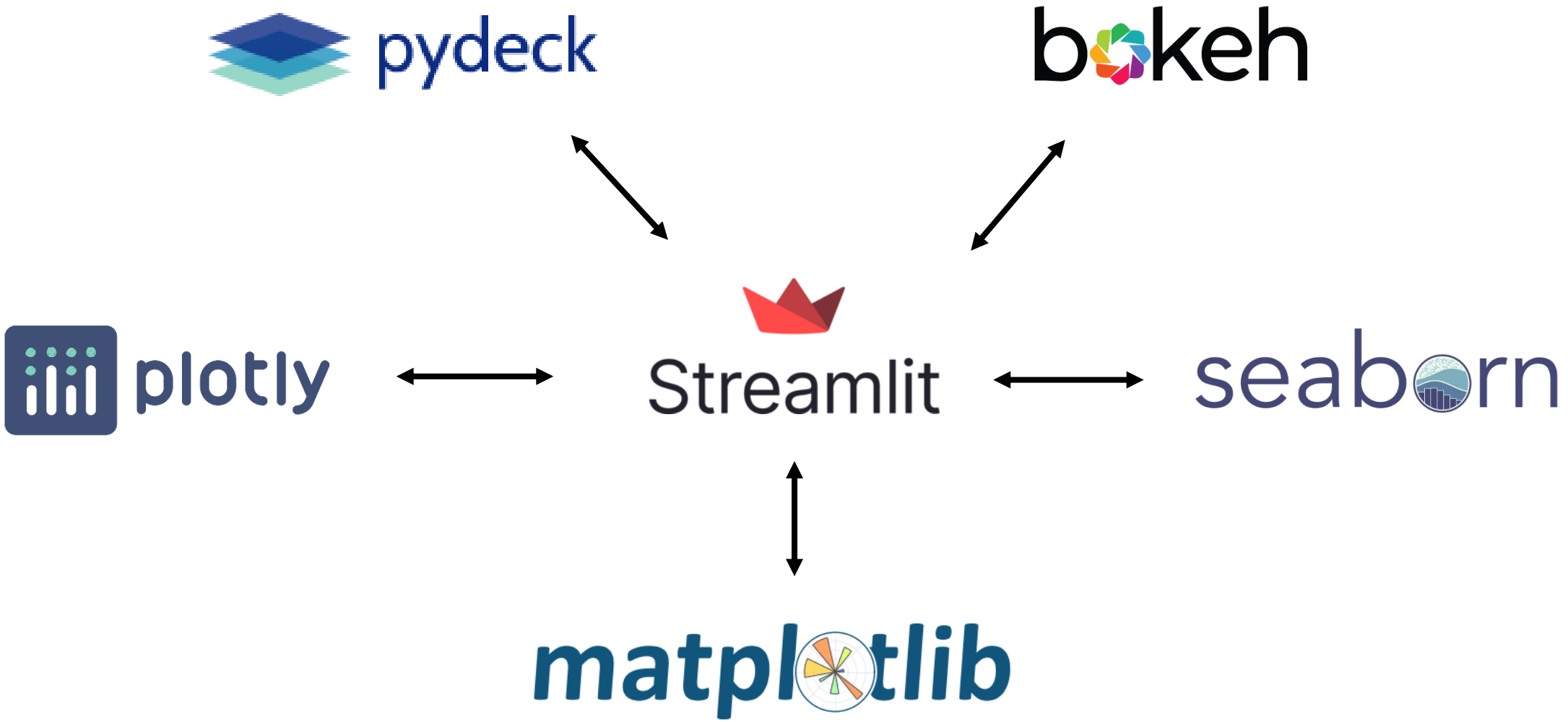
06. Block Diagram of Streamlit's Components

◆ Code → Server → Browsers

✓ Python Script → Cache → Client



07. Connect to Visualizations



08. Configuration

◆ 설정 시스템을 사용하면 Streamlit Web 동작을 사용자 지정할 수 있음

✓ Streamlit Configuration File은 '~/.strealmit/config.toml' 경로에 지정(Global Settings)

✓ Environment Variables

- `STREAMLIT_`으로 지정한다.

✓ 주요 sections and options

sections	설명
[server]	서버의 포트를 구성하고, Web 폴더의 기본 경로, CookieSecret 설정, CORS(Cross-Origin Resource Sharing) 설정
[theme]	웹의 기본 색상, 배경색 등의 옵션을 사용하여 Web의 형태 사용자 지정 가능
[browser]	실행할 기본 브라우저와 실행 동작 설정, IP address와 DNS name 설정 가능
[logger]	Logging 수준과, 로그 메시지의 대상을 정의
[runner]	경고 비활성화 또는 최대 메시지 크기 설정 등, Streamlit 스크립트가 실행하는 방식 조정

09. Interactive Widgets

◆ 기본 튜토리얼 확인 : https://docs.streamlit.io/library/cheatsheet

Home / Streamlit library / **Cheat sheet**

Cheat Sheet

This is a summary of the docs, as of Streamlit v1.28.0.

Install & Import

```
streamlit run first_app.py

# Import convention
>>> import streamlit as st
```

Command line

```
streamlit --help
streamlit run your_script.py
streamlit hello
streamlit config show
streamlit cache clear
streamlit docs
streamlit --version
```

Pre-release features

```
pip uninstall streamlit
pip install streamlit-nightly -
```

Learn more about experimental features

Magic commands

```
# Magic commands implicitly
# call st.write().
'_This_ is some **Markdown***'
my_variable
'dataframe:', my_data_frame
```

Control flow

```
# Stop execution immediately:
st.stop()
# Rerun script immediately:
st.rerun()

# Group multiple widgets:
>>> with st.form(key='my_form'
>>>     username = st.text_input
>>>     password = st.text_input
>>>     st.form_submit_button('L
```

Connect to data sources

```
st.connection("pets_db", type='
conn = st.connection("sql")
conn = st.connection("snowflak

>>> class MyConnection(BaseCon
>>>     def _connect(self, **kw
>>>         return myconn.conne
>>>     def query(self, query):
>>>         return self._instanc
```

Display text

```
st.text('Fixed width text')
st.markdown('_Markdown_') # see
```

Streamlit

강의 실습 영상 참고