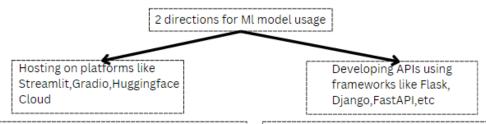
# **ML Dev Deployment of ML models**

The flowchart below will help you to better understand basic deployment methods



- You need a quick, interactive UI for demonstration or prototyping purposes.
- You want to create a web application with minimal web development effort.
- Your application is more focused on presenting data and models rather than serving them to other applications.

#### Pros:

- · Easy to use and set up.
- · Great for quick iterations and prototyping.
- · Built-in components for UI elements.

### Cons

- Less control over the server and deployment environment.
- Not ideal for production-level applications that need scalability and security.

- You need a robust backend to handle various client requests.
- Your model needs to be accessed by multiple clients or integrated into a larger application.
- You need more control over the deployment environment and scalability.

#### Pros:

- Full control over the application and deployment environment.
- Scalable and can handle complex logic and multiple endpoints.
- · Suitable for production-level applications.

### Cons

- Requires more setup and understanding of web development.
- More boilerplate code compared to Streamlit.

# Process 1- Expose Model As An API

- 1. Model Training will happen in server
- 2. You can save model with .pkl,.sav,.pb.h5.pt.pth, .tfjs extensions
- You can host these models in server side using frameworks like Flask, Django, Falcon, Klein and expose it as API
- These API can be consumed by any front end application including mobile app

## What should you learn?

Model deployment in machine learning is the process of integrating your model into an existing production environment where it can take in an input and return an output. The goal is to make the predictions from your trained machine learning model available to others

- <a href="https://builtin.com/machine-learning/model-deployment">https://builtin.com/machine-learning/model-deployment</a>
- Gradio Crash Course Fastest way to build & share Machine Learni...
- Gradio Course Create User Interfaces for Machine Learning Models (too long but it will help you to understand code and the flow better)
- [2024 Spring] Data Engineering Deploying ML models and creating demos with Streamlit and Gradio (watch 2x)
- <a href="https://webcache.googleusercontent.com/search?q=cache:https://calistussaratuki.medium.com/embedding-a-machine-learning-model-model-into-a-gui-d3745e63e6">https://webcache.googleusercontent.com/search?q=cache:https://calistussaratuki.medium.com/embedding-a-machine-learning-model-model-into-a-gui-d3745e63e6</a> (Code implementation of Streamlit and Gradio)
- You can also see streamlit community cloud a low code cloud deployment platform

### **Custom APIs for models**

- https://konghq.com/blog/learning-center/different-api-types-and-use-cases (
  We will be using RestAPIs- POST,GET,DELETE,etc HTTP methods)
- https://www.enjoyalgorithms.com/blog/api-introduction-for-data-science-and-ml
- Machine Learning And Deep Learning Model Deployment Architecture Using A...
- <u>FastAPI: The Modern Toolkit for Machine Learning Deployment | by Reza</u>
  Shokrzad | Medium

- https://towardsdatascience.com/creating-restful-apis-using-flask-and-python-655
  bad51b24 (Code template for Flask)
- Deployment of Deep Learning Model using Flask
- <u>fastapi2postman: Automate Your FastAPI to Postman Collection Conversion | by Ashhad Ahsan Rehman | Medium</u>
- I built the same app 3 times | Which Python Framework is best? Django vs ...
  (Flask, Django, FastAPI)

## Integrating FlaskAPI(backend) with Streamlit(UI)

- <a href="https://www.restack.io/docs/streamlit-knowledge-streamlit-flask-api-integration">https://www.restack.io/docs/streamlit-knowledge-streamlit-flask-api-integration</a>
- <a href="https://freedium.cfd/https://python.plainenglish.io/building-a-web-application-with-flask-and-streamlit-279cf577d973">https://freedium.cfd/https://python.plainenglish.io/building-a-web-application-with-flask-and-streamlit-279cf577d973</a> (this article is paid on medium so freedium gives access)