

# Docker Practise Projects

## Basic

- How would you containerize and serve a static website using Nginx?
- How can you set up a Jekyll site inside Docker so it can be built and previewed without installing Jekyll locally?
- What steps are needed to create a simple Nginx web server container that serves an index.html file from your host?
- How do you Dockerize a Python script that processes CSV data with pandas, ensuring dependencies are portable?
- How can you build and run a multi-container Flask + MySQL app using Docker Compose?
- What is Dockercraft, and how does it help visualize Docker concepts in a gamified way?

## Intermediate

- How would you structure a microservices app using Docker Compose, ensuring inter-container communication?
- What steps are needed to set up a CI/CD pipeline that builds, tests, and deploys Dockerized apps with Jenkins or GitHub Actions?
- How do you deploy and scale a Memcached service in Docker, while monitoring its performance?
- How would you use RancherVM to run and manage Docker containers inside virtual machines?
- How can you containerize a Node.js application using a multi-stage build to reduce image size?
- How would you containerize a TensorFlow machine learning model for portable inference?
- What's the process for creating a reproducible data science environment with Jupyter, pandas, NumPy, and scikit-learn in Docker?
- How do you deploy apps using Dokku (self-hosted Git push deployment on Docker)?
- How would you package and deploy a web application using Passenger-Docker?

## Advanced

- How do you integrate KubeVirt with Kubernetes to run both VMs and containers in the same cluster?

- What steps are involved in optimizing a Python app image using Alpine Linux and multi-stage builds?
- How would you containerize and optimize a PyTorch deep learning pipeline for inference?
- How can you use Docker + Apache Airflow to build and orchestrate automated data pipelines?
- What's the process for building and deploying a FastAPI-based machine learning API inside Docker?

## Hard

- How would you design and implement a zero-downtime deployment pipeline using Docker, reverse proxies, and blue-green or canary strategies?
- Explain in detail how Docker uses UnionFS and copy-on-write layers. How would you troubleshoot layer bloat in a large CI/CD pipeline?
- You need to run Dockerized workloads in a multi-tenant environment. How would you isolate security risks (covering seccomp, AppArmor, SELinux, rootless mode)?
- How do you optimize Docker performance for high-throughput data pipelines, especially when using overlay networks in Swarm or Kubernetes?
- Explain how you would debug a network partition issue in a multi-node Swarm cluster, ensuring minimal downtime and recovery.