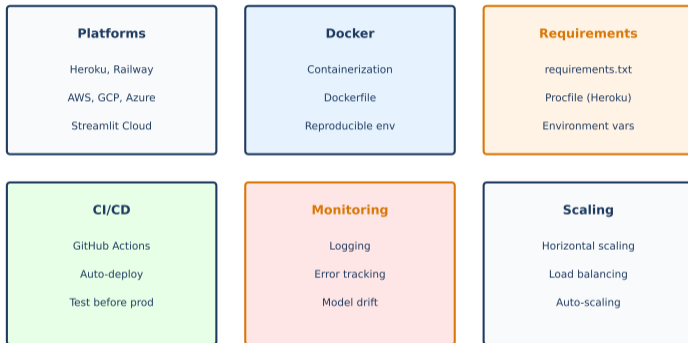


Lesson 44 Summary: Cloud Deployment

Data Science with Python – Key Concepts

Data Science Program

Cloud Deployment for ML



Deploy ML models to production environments

Where to deploy:

- **Simple:** Heroku, Railway, Render
- **Enterprise:** AWS, GCP, Azure
- **Streamlit:** Streamlit Cloud (free tier)

Choose based on scale and budget

Containerization:

- **Dockerfile:** Define environment
- **Image:** Packaged application
- **Container:** Running instance

Same environment everywhere

Dependency management:

- **requirements.txt:** Python packages
- **Procfile:** Start command (Heroku)
- **.env:** Environment variables

Reproducible deployments

Automation:

- **GitHub Actions:** Auto-deploy on push
- **Testing:** Run tests before deploy
- **Rollback:** Easy version control

Automate the deployment pipeline

Essential Commands:

| Task | Code |
|---------------------|-----------------------------------------------|
| Create requirements | <code>pip freeze > requirements.txt</code> |
| Docker build | <code>docker build -t app .</code> |
| Docker run | <code>docker run -p 8000:8000 app</code> |
| Heroku deploy | <code>git push heroku main</code> |
| Streamlit Cloud | Connect GitHub repo |

Deploy ML models at scale with cloud platforms