

Module 6: Day 1

Debrief & Troubleshooting

Optimizing Model Deployment and Code Integrity

01. Debugging Fundamentals

| Debugging Methodology



Isolate

Use print statements or debuggers to isolate the specific logic causing the failure.



Reproduce

Create a minimal, reproducible example to test your fix without side effects.



Verify

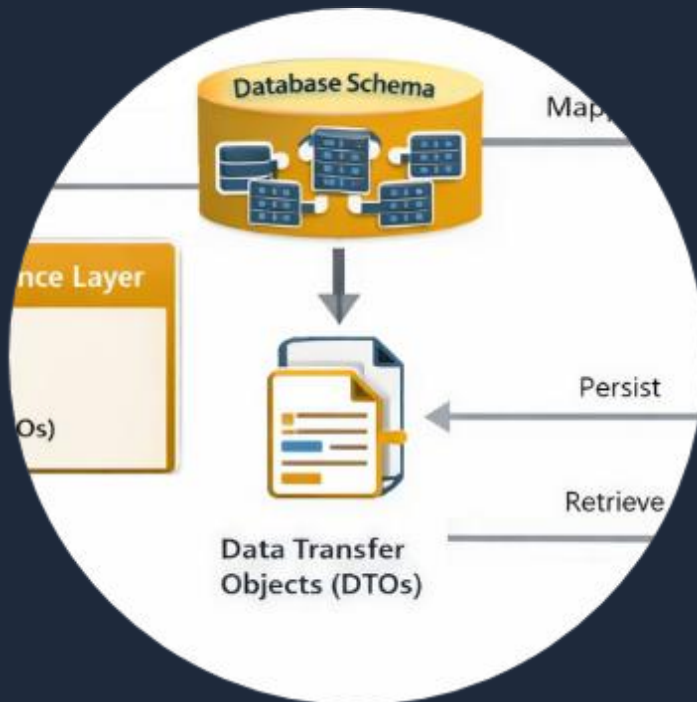
Validate the fix across test cases to ensure the issue doesn't persist.

| Common Implementation Pitfalls

- ❗ **Data Mismatches:** Ensuring input shapes match training dimensions.
- ❗ **Environment Drift:** Library versions differing between dev and prod environments.
- ❗ **Hardcoding:** Relying on absolute paths instead of environment-relative variables.

02. Model Persistence

| Persistence Concept



Model persistence is the process of saving a trained model to a file so it can be reloaded later for inference without retraining.

This transforms a volatile memory object into a reusable digital asset.

| The Serialization Workflow

Using the pickle library to serialize Python objects is the standard way to export models.

```
pickle.dump(model, open('model.pkl', 'wb'))
```



| Comparison of Saving Methods

Method	Use Case
Pickle	General Python objects
Joblib	Best for large NumPy arrays

| Deployment Pipeline

1. Train



2. Export



3. Inject

Production Injection

Moving from a local script to a production server requires secure handling and infrastructure awareness.

Anatomy of a Modern CI/CD Pipeline

Automating the path from developer commit to production with continuous integration and deployment for faster, safer software delivery.

(CI) - Building & Testing the Code

Part 2: Continuous Deployment (CD) - R



| Success Metrics

99
%

Model Uptime

Ensuring models are persistent and available for inference tasks consistently.

Questions?

| Image Sources



https://miro.medium.com/v2/resize:fit:2000/1*mCc2WO9byzqBdsvda73Rhg.png

Source: levelup.gitconnected.com



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Source: devblogs.microsoft.com



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Source: medium.com