



Module 12

Workshop 1: Detecting and Responding to Model Drift in Production



When the model drifts...

Imagine your shopping app drifts and starts making bizarre recommendation (like 50 cans of dog food when you don't own a dog).

What other funny or weird recommendations might a "drifting" shopping app give you?

Type your ideas in the chat!





Module 12

Workshop 1: Detecting and Responding to Model Drift in Production



Agenda

- **Review:** Recap key concepts.
- **Practical exercise:** ShopSmart drift response plan.
- **Closing:** Wrap up and reflection.



Learning objectives

- ◆ Detect and classify different types of model drift in production ML systems.
- ◆ Design monitoring dashboards that link drift indicators to performance metrics and business outcomes.
- ◆ Propose maintenance and testing strategies to respond to drift and ensure safe deployment of model updates.



Async review: Unit 1

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Workshop 1

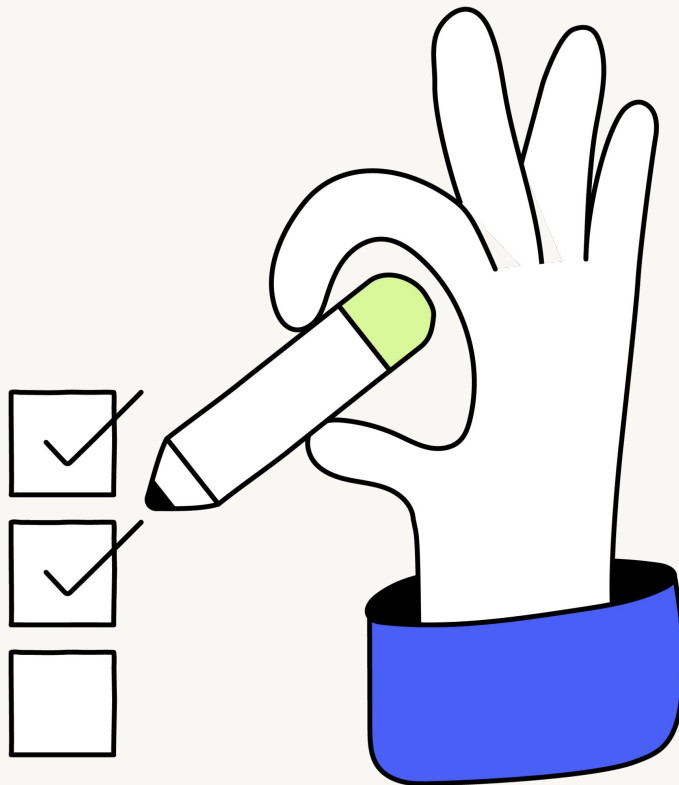


Navigate to the **"Async review"** page



Review the summary of Unit 1, then
complete the following Poll:

How well do we know drift?





Poll debrief

- In production ML systems, drift can take many forms—data, concept, feature, or label.

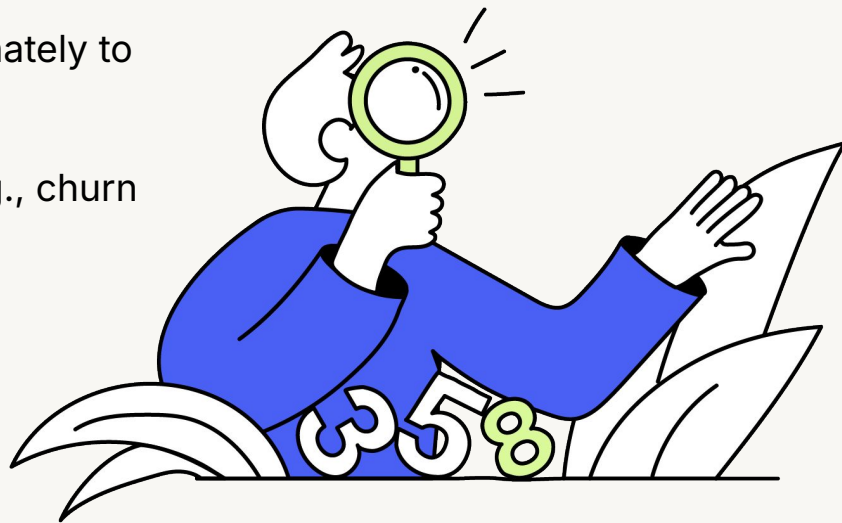


Which type of drift do you think is hardest to monitor and explain in real-world practice?



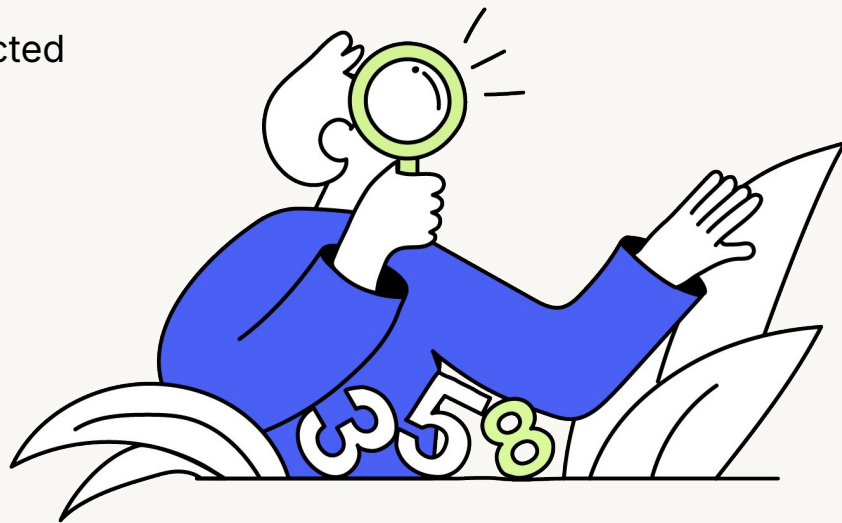
Types of drift

- **Data drift:** Input features shift (e.g., customer age distribution changes).
- **Concept drift:** Relationship between input and target shifts (e.g., age no longer predicts churn the same way).
- **Feature drift:** One feature changes disproportionately to others (e.g., subscription type categories).
- **Label drift:** Target variable distribution shifts (e.g., churn rate spikes).



Statistical methods for detecting drift

- **Population Stability Index (PSI):** Widely used in industry to flag distribution shifts in features over time.
- **KL divergence:** Measures how one probability distribution diverges from another.
- **Chi-squared test:** Compares observed vs. expected frequencies for categorical variables.
- **Wasserstein distance:** Captures differences in continuous feature distributions.



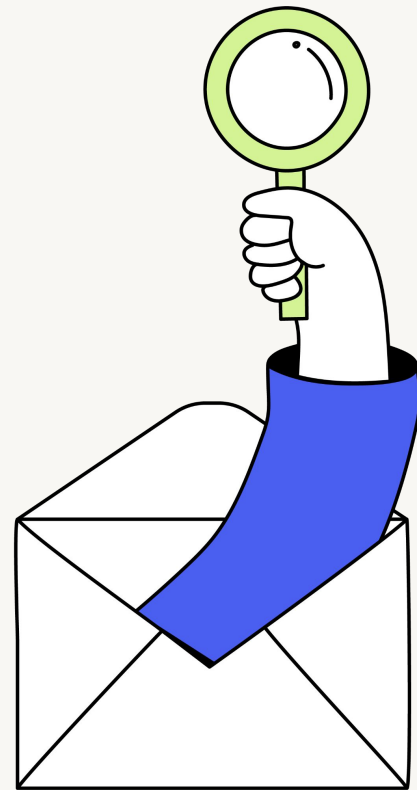


Practical exercise: ShopSmart drift response plan



Practical exercise: Context

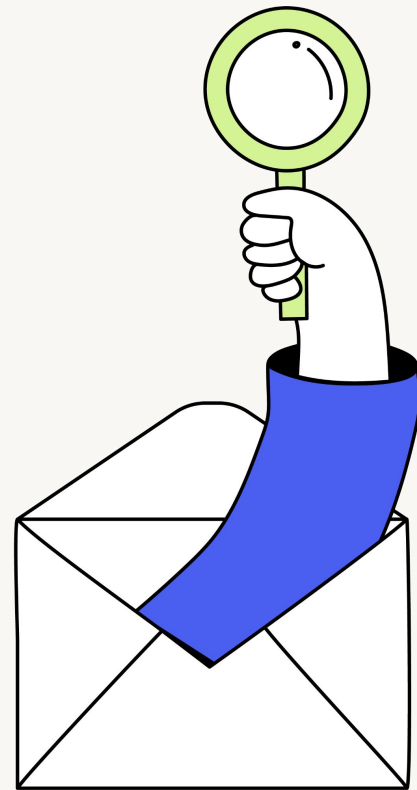
- **Company:** ShopSmart, an online retailer using ML to personalise recommendations and predict product returns.
- **Initiative:** A return-prediction model helps reduce costs, optimise inventory, and improve customer experience.
- **Challenge:** Recent growth has shifted customer behavior. Data distributions are changing, and model performance is declining—signs of drift that require a response plan.





Practical exercise instructions

- Work in breakout rooms in small groups.
- Step into the role of ShopSmart's data science team.
- Find all instructions and resources on Ariel.





Access the skills application

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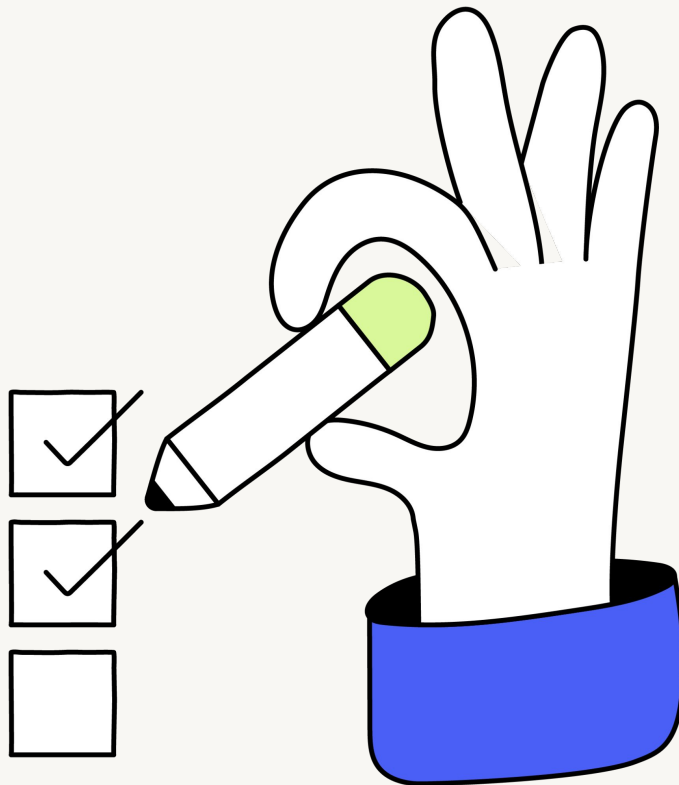
Navigate to the **"Practical exercise"**
page



Start working on the activity tasks



Be prepared to share in 20 minutes
when we come back together





Group discussion debrief



Practical exercise debrief

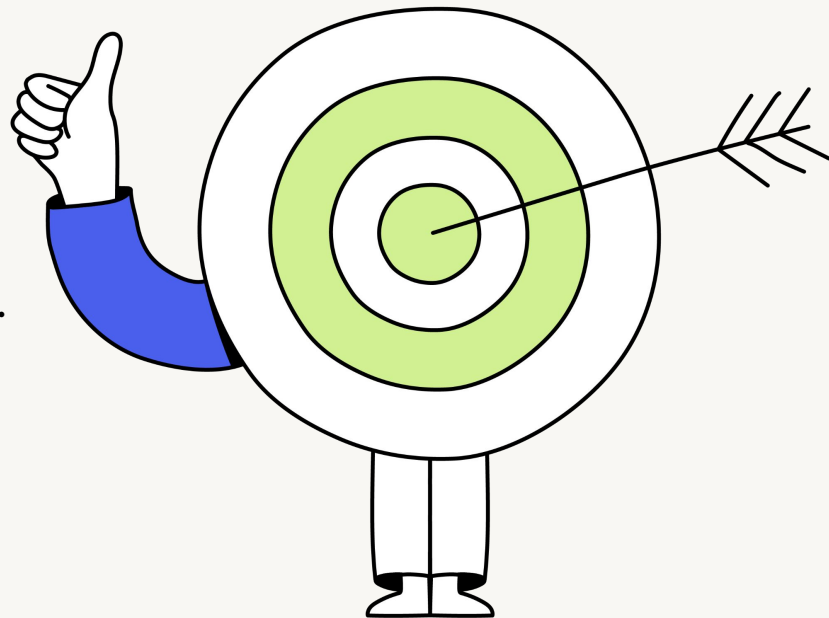
- 1 What is **one drift signal** your group identified in the ShopSmart model?
- 2 What is one **monitoring or testing strategy** you would recommend to manage that drift?
- 3 How would you explain the **business impact** of drift to a non-technical stakeholder?





Key takeaways

- 1 Drift shows up in data, predictions, or labels.
- 2 Link drift indicators to performance impact.
- 3 Use monitoring and testing to manage drift.
- 4 Explain drift in business terms to gain buy-in.





Applying **key** **takeaways** to your organisation



Applying key takeaways

- 1 How does your organisation currently monitor ML models in production?
- 2 Where might drift risks exist in your systems or workflows?
- 3 What steps could your team take to improve drift detection, testing, and communication with stakeholders?



Share your plan to apply new skills

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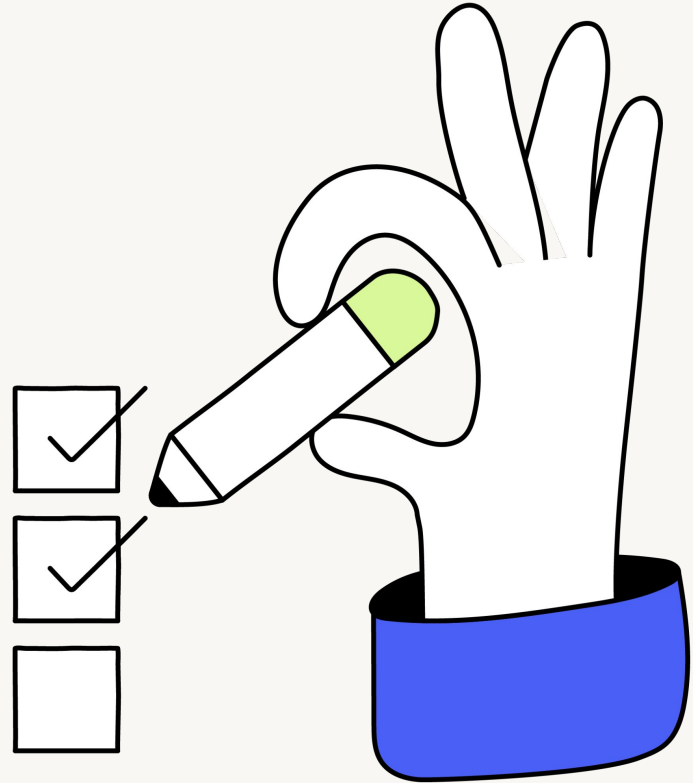
Navigate to the discussion activity
page **"Apply new skills to your role"**



Take 5 minutes to share how you will
apply this skill in your role



Take time this week to read what
others have written and get new ideas!





Closing out

- **Next workshop:** Scaling and Governing ML Systems across the Lifecycle
- **Have questions?**
 - Chat with Atlas
 - Reach out to your Cohort Coach
 - Sign up for Tutoring
- **Log your OTJ hours**
- **Take the Workshop Survey** on My Multiverse

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