Module 7

Kickoff Workshop

Icebreaker

This module focuses on three key areas:

1. Boost Model Efficiency & Accuracy (making models faster and more correct)
2. Maximize Model Performance & Value (getting the best possible outcomes from our models)
3. Drive Ethical & Reliable Outcomes (ensuring our models are fair and trustworthy)

Think for a moment about your own role or industry. What's one area where you see a significant opportunity to apply one or more of these optimisation skills to create real business value or solve a critical problem? Describe the challenge and how you envision one of these skills making an impact.

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Agenda

- Welcome and introduction
- Module overview
- Applying module skills
- Project overview
- Q&A
- Next steps

Module overview

Your learning journey

Week 1	Kickoff Workshop	Async Unit 1	Async Unit 2	Live Workshop 1
Week 2	Async Unit 3	Live Workshop 2	Wrap-Up Workshop	
Week 3	Group Coaching			
Week 4	Project tasks			

Module skills: from learning to applying

Apply training to optimise models; minimise overfitting; accelerate convergence for faster, more accurate results.	Apply gradient descent and regularisation techniques to significantly reduce the training time of a customer churn prediction model. This directly translates to quicker deployment of insights and more responsive customer retention strategies.
Implement advanced strategies; maximise model robustness; optimise for critical business metrics; ensure reliable predictions.	Use hyperparameter tuning and ensemble methods to improve the predictive accuracy of a fraud detection system, leading to a substantial reduction in false positives and financial losses. Their calibrated model provides more reliable probability scores, allowing for more informed risk management decisions.
Design robust data splits; implement imbalance techniques; develop data quality protocols.	Design robust data splitting and imbalanced dataset handling strategies for a loan application model to ensure equitable lending decisions across diverse demographics. This proactive approach not only builds customer trust but also mitigates potential regulatory and reputational risks

Skill 1 in the real-world

Boost Model Efficiency & Accuracy

ShopSmart, a retail company, struggled with a slow-performing recommendation engine that frequently provided irrelevant suggestions, leading to decreased customer engagement and sales.

The data science team at ShopSmart applied advanced optimisation techniques, including adaptive learning rates and carefully tuned regularisation parameters, to their recommendation engine.

This significantly sped up model training and improved recommendation accuracy, leading to a uplift in customer satisfaction and a increase in conversion rates.

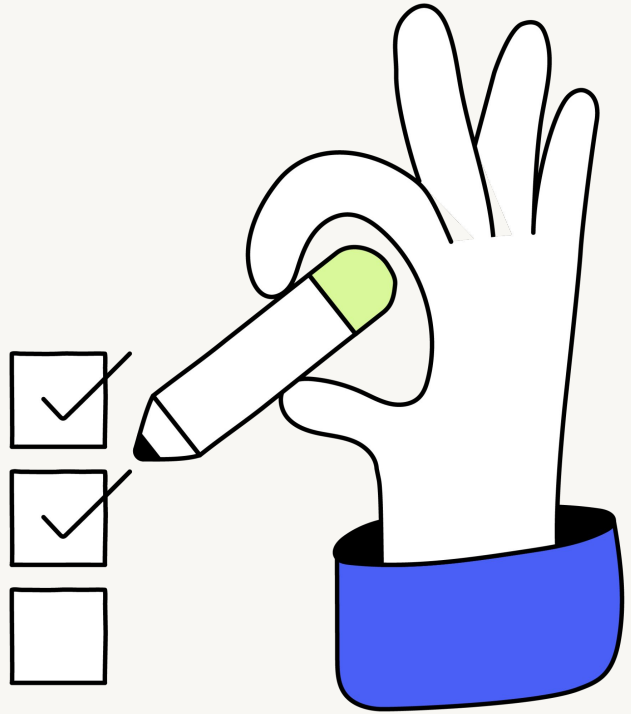
Applying module skills to your workplace

Skills application brainstorm

Choose a module skill and think of 3 ways to apply it in your role

Create a post for the group explaining how you'd like to apply this skill this month

Post your explanation in the Skill Application Brainstorm discussion board



Skill application share out

1. Review other discussion posts.
2. Choose another person’s post that you think is a great example of applying the skill.
3. Raise your hand to share your thoughts.

Project overview

Phase 2 project: Applying ML techniques

Project objective: Build and refine an ML model for performance, fairness, and security. Use XAI to address bias, define key metrics, and ensure full compliance with robust documentation and retraining plans.

Module 6 milestone: Model Engineering and Training

Module 7 milestone: Optimising Models

Module 8 milestone: Model Evaluation

Module 9 milestone: Data Security, Privacy, and Governance

We are here!

There are no new milestones this module, you will continue to work on Module 6's milestones

Module 6 + 7 milestone: Model engineering and training

Phase project objective: Build and refine an ML model for performance, fairness, and security. Use XAI to address bias, define key metrics, and ensure full compliance with robust documentation and retraining plans.

Milestone task 1

Model development and training fundamentals: Build and train an initial version of the ML model using the refined dataset from Phase 1. Experiment with different algorithms and hyperparameters to determine the most effective approach.

Milestone task 2

Training process optimisation: Optimise the training process by systematically tuning hyperparameters, adjusting dataset sampling techniques (e.g., oversampling, undersampling, stratified sampling), and experimenting with advanced training techniques (e.g., transfer learning, ensemble methods, if relevant to your chosen algorithm and problem).

Milestone task 3

Identifying sources of bias and mitigation: Evaluate the model for algorithmic bias by analysing dataset imbalances, prediction disparities across different subgroups (if relevant to your data and problem), and relevant fairness metrics (e.g., demographic parity, equalised odds).

Module 6 + 7 milestone: KSB requirements

Phase project objective: Build and refine an ML model for performance, fairness, and security. Use XAI to address bias, define key metrics, and ensure full compliance with robust documentation and retraining plans.

Task 1 KSBs → **Model Development and Training Fundamentals:** K19, S12

Task 2 KSBs → **Training Process Optimisation:** K19, S12, B5

Task 3 KSBs → **Identifying Sources of Bias and Mitigation:** B5, K20

Questions?

Closing out

- **Action items:** Async Unit 1
- **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

multiverse