MATLAB Programming Section 08: Teacher Guide

Storyline

In this lesson, the students will be building off the final project they started in Section 07. This lesson will not have an Elicit or Refine section as the students will use much of the time working on their final project. The lecture portion of this lesson demonstrates techniques to evaluate regression and classification models and applies statistical methods that the students will use to evaluate their AI models for their final project. The students will then apply what they learned in the lecture to their final project as they follow along with a template that combines the examples from Sections 07 and Section 08.

Main Learning Goal

Students will learn how to evaluate regression and classification models in MATLAB by examining metrics such as the confusion matrix, accuracy, precision, recall, and F1-score. Additionally, students will apply statistical methods such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and R-squared (R^2) to evaluate their AI models.

Focus Question

How can we ensure the model works as intended?

Develop

How will I get students to explore, explain, and develop ideas?

Activity Name and Description	Teacher Moves	Student Moves	Resources
• **Final Project – Evaluating and Refining Your Model** • *30 minutes* • This lecture, acting as a reference for the students, demonstrates how to evaluate regression and classification	• Introduce students to the empty project template and the reference document for Section 07 (the template will have steps 1-6 from Section 07	• The students will either follow along on MATLAB online or download the Live Script file and data files to walk through	• categorical • sum • diag • numel • zeros • if, elseif, else • for • abs • mean • any • isnan • isinf • MATLAB Operators and

Activity Name and Description	Teacher Moves	Student Moves	Resources
models and then apply statistical methods that the students will use to evaluate their AI models. • All Live Script file is available in the MATLAB Drive • The data files are available here: FIFA 23 male players.csv	and steps 7-8 from Section 08 reference documents respectively). • The teacher will ensure the students have the correct Live Script file and data files so they can follow along. • The teacher will walk the students through the lecture. • The teacher should encourage questions and provide answers to students throughout the lecture.	the lecture. • The students should take notes so they can implement the methodology shown in the lecture in their final project. • The students should actively engage throughout the lesson, asking questions as needed.	Special Characters

Deploy

How will I get students to use and apply their ideas to what they've learned?

Activity Name and Description	Teacher Moves	Student Moves	Resources
• **Refining Your Final Project** • *40-50 minutes*	• The teacher will ensure the students	• The students will	

Activity Name and Description	Teacher Moves	Student Moves	Resources
• Following the Template combining examples from Sections 07 and 08, the students should continue working on their final project within the template Live Script. • The assignment can be found here: Section 08 Assignment - Refining Your Model	have the necessary data files and Live Script file for reference as they complete the assignment. • The teacher will encourage independent work and help as needed.	independently continue working on their final projects, using the example set in the lecture as a reference of how to refine their AI model. • The students should ask questions as necessary. • Once completing as much as possible in the allotted time, the students will submit their work as a Live Script file in the assignment.	