**Module 3 – Strategic Alliance Selection**

Welcome to Module 3! Here’s what’s included:

* **Video Tutorial** – Step-by-step walkthrough of the analysis process
* **Dataset** – Raw data for hands-on practice
* **RapidMiner Process File** – Pre-built workflow to replicate the analysis

Get started by watching the video and exploring the dataset.

**Objective**

This workflow aims to prepare and analyze a robotics competition dataset in **Altair AI Studio** to classify teams based on their performance as *Autonomous Specialists*, *Teleop Specialists*, *Balanced Specialists*, or *Developing Teams*. The goal is to clean, transform, and engineer relevant features to drive meaningful insights from team performance metrics.

**Step-by-Step Workflow in AI Studio**

1. **Launch AI Studio**.
2. **Import** the provided dataset into a repository of your choice.
3. Use the **Retrieve** operator to access and load the dataset into your process.

A screenshot of a computer

AI-generated content may be incorrect.

1. Use the **Select Attributes** operator to remove any unnecessary attributes.
2. Navigate to the **Statistics** tab to check for missing values.

A screenshot of a computer

AI-generated content may be incorrect.

1. Use the **Replace Missing Values** operator to handle missing data in selected attributes. Replace missing values with the string "NA".’

A screenshot of a computer

AI-generated content may be incorrect.

1. Use the **Filter Examples** operator to narrow down the dataset to a single event (if needed).
2. Use the **Generate Attributes** operator to create key performance metrics such as:
   * Total\_Auto\_Coral
   * Total\_Auto\_Algae
   * Total\_Teleop\_Algae
   * Total\_Teleop\_Coral
   * Total\_Auto\_Score
   * Total\_Teleop\_Score

A screenshot of a computer

AI-generated content may be incorrect.

1. Use the **Numerical to Polynomial** operator to convert Team Number into a categorical attribute.
2. Use the **Set Role** operator to assign Team Number as the **ID** (unique identifier).
3. Use the **Aggregate** operator to generate summary statistics for each team. Group by Team Number and calculate:
   * Average(Total\_Auto\_Score)
   * Average(Total\_Teleop\_Score)
   * Average(Total\_Barge\_Points)
   * Average(RP\_Barge)
   * Count(Cooperation\_Bonus)

A screenshot of a computer

AI-generated content may be incorrect.

1. Use the **Rename** operator to make attribute names clearer and easier to interpret.
2. For deeper classification, go to the **Statistics** tab and note the mean values of Average\_Auto\_Score and Average\_Teleop\_Score

A screenshot of a computer

AI-generated content may be incorrect.

1. Add another **Generate Attributes** operator to create a new column called Team\_Strength using this logic:

*if(Average\_auto\_score >= 18 && Average\_auto\_score > Average\_teleop\_score,*

*"Autonomous specialists",*

*if(abs(Average\_auto\_score - Average\_teleop\_score) <= 0.05 \* max(Average\_auto\_score, Average\_teleop\_score),*

*"Balanced specialists",*

*if(Average\_teleop\_score > 13.5,*

*"Teleop specialists",*

*"Developing teams"*

*)*

*)*

*)*

1. Finally, use the **Filter Examples** operator to isolate specific team categories based on Team\_Strength and generate actionable insights.

A screenshot of a computer

AI-generated content may be incorrect.

A graph with red and blue ovals

AI-generated content may be incorrect.