Modelling and Prediction of Athletic Readiness based on Sleep and Recovery Patterns

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A. Progress Summary

1) Work Completed:

- **Thorough Data Analysis for Model Tuning:** Conducted an in-depth analysis of dataset distributions and feature interactions.
- **Choosing the Best Imputed Dataset:** Evaluated multiple imputation methods and finalized the most effective dataset for model training.
- **Dataset Augmentation:** Explored techniques to enhance dataset diversity for better model performance.
- **Hyperparameter Optimization:** Focused on tuning **Ridge Regression** and **LightGBM**, the best-performing models.
- **Performance Evaluation:** Assessed refined models using MAE, RMSE, and R^2 Score.

2) Milestones achieved:

- Successfully conducted a comparative study on different imputed datasets.
- Improved Ridge Regression and LightGBM models through hyperparameter tuning.
- Explored data augmentation strategies to enhance model generalization.

B. Challenges & Resolutions

C. Problems Faced

- **Selecting the Best Imputed Dataset:** Different imputation techniques had varying impacts on model performance.
- **Hyperparameter Optimization Complexity:** Tuning parameters required extensive testing to prevent overfitting.
- **Dataset Augmentation Effectiveness:** Ensuring augmented data maintained statistical consistency.

D. Upcoming Tasks

1) Tasks Planned:

- Finalizing dataset augmentation techniques for improved robustness.
- Conducting additional validation and generalization tests.