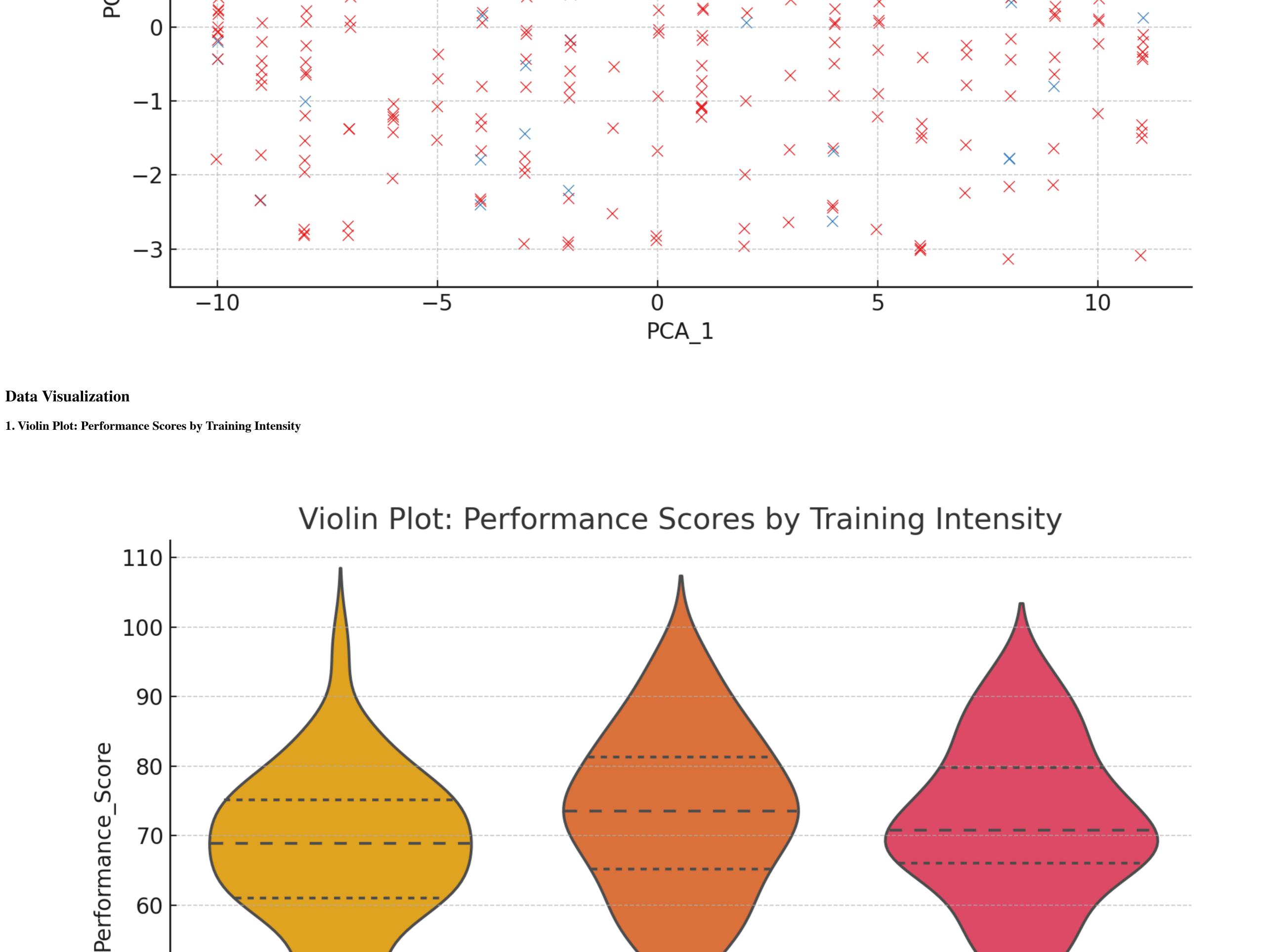
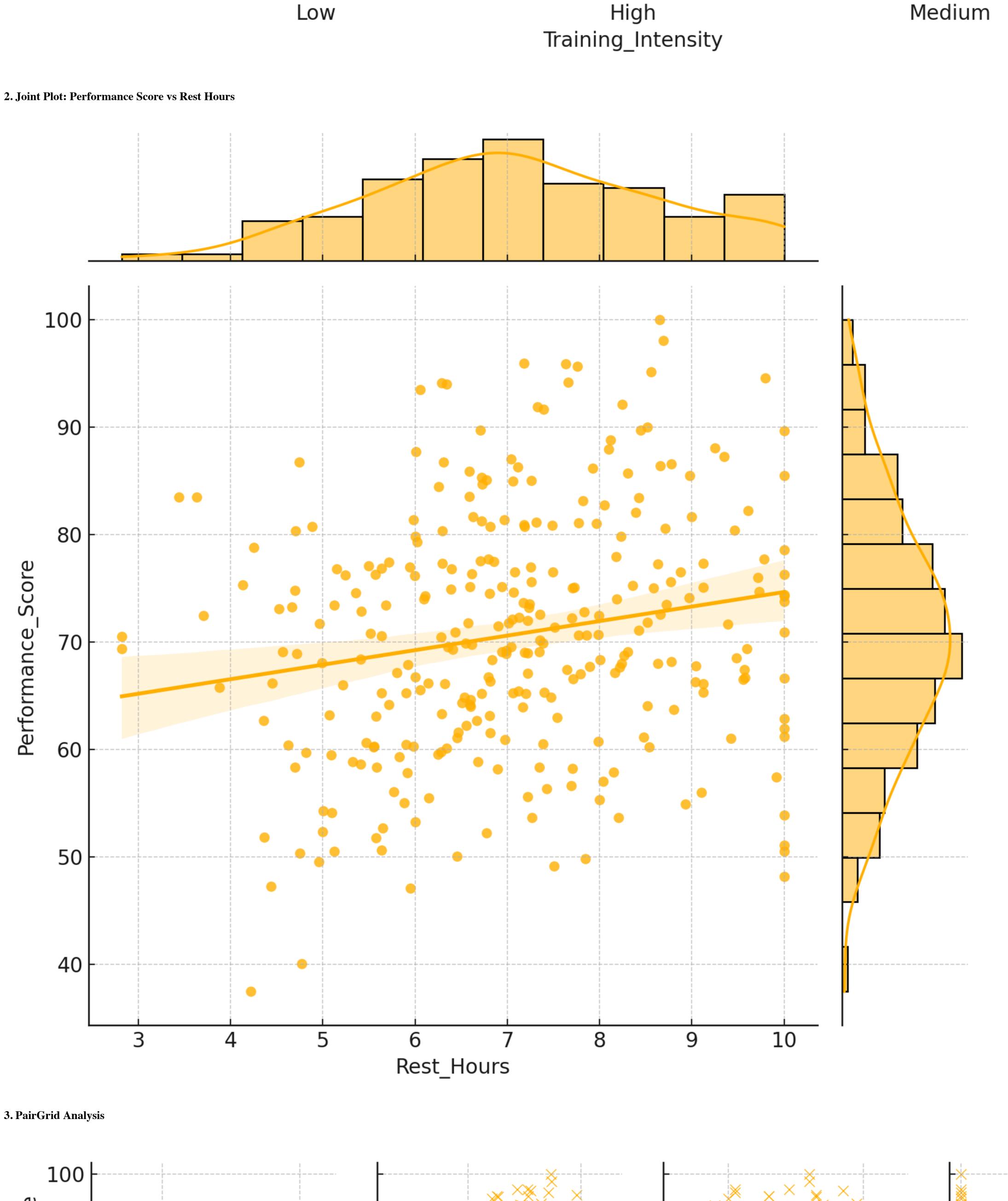
Health & Fitness Analytics Project **Project Objective** The objective of this project is to analyze how different training regimens, diet quality, and rest periods affect athletic performance and injury risk. **Data Science & Analytics** 1. Predictive Analysis OLS Regression Results \_\_\_\_\_\_ Dep. Variable: Performance\_Score R-squared: 0.059 Model: Adj. R-squared: Least Squares 5.689 Method: F-statistic: Sat, 17 Aug 2024 Prob (F-statistic): 0.000201 Date: 05:14:40 -1143.4 Log-Likelihood: Time: AIC: 2297. No. Observations: 300 BIC: 2315. Df Residuals: 295 Df Model: Covariance Type: nonrobust 0.975] std err [0.025 \_\_\_\_\_ 13.743 68.530 Training\_Intensity\_Binary 2.6083 0.766 3.404 0.001 1.100 4.117 Diet\_Quality\_Binary -0.3082 -0.392 0.695 -1.854 1.238 1.2909 0.410 3.147 Rest\_Hours 0.002 0.484 2.098 -0.0153 -0.157 0.176 Durbin-Watson: 1.998 Omnibus: 2.015 0.288 Jarque-Bera (JB): Prob(Omnibus): 0.365 0.056 Prob(JB): Skew: 2.615 Cond. No. Kurtosis: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. 2. Feature Importance Analysis Feature Importance in predicting Performance Scores: Rest\_Hours 0.530675 0.273426 Training\_Intensity\_Binary 0.100170 Diet\_Quality\_Binary 0.095729 dtype: float64 Feature Importance for Predicting Performance Quality\_Binary tensity\_Binary Age Rest\_Hours 0.5 0.0 0.1 0.2 0.3 0.4 Importance 3. Logistic Regression for Injury Prediction 244 0.91 1.00 4. Principal Component Analysis (PCA) PCA: Visualizing Principal Components with Injury Risk Injury\_Risk  $\times$  $\times$ 

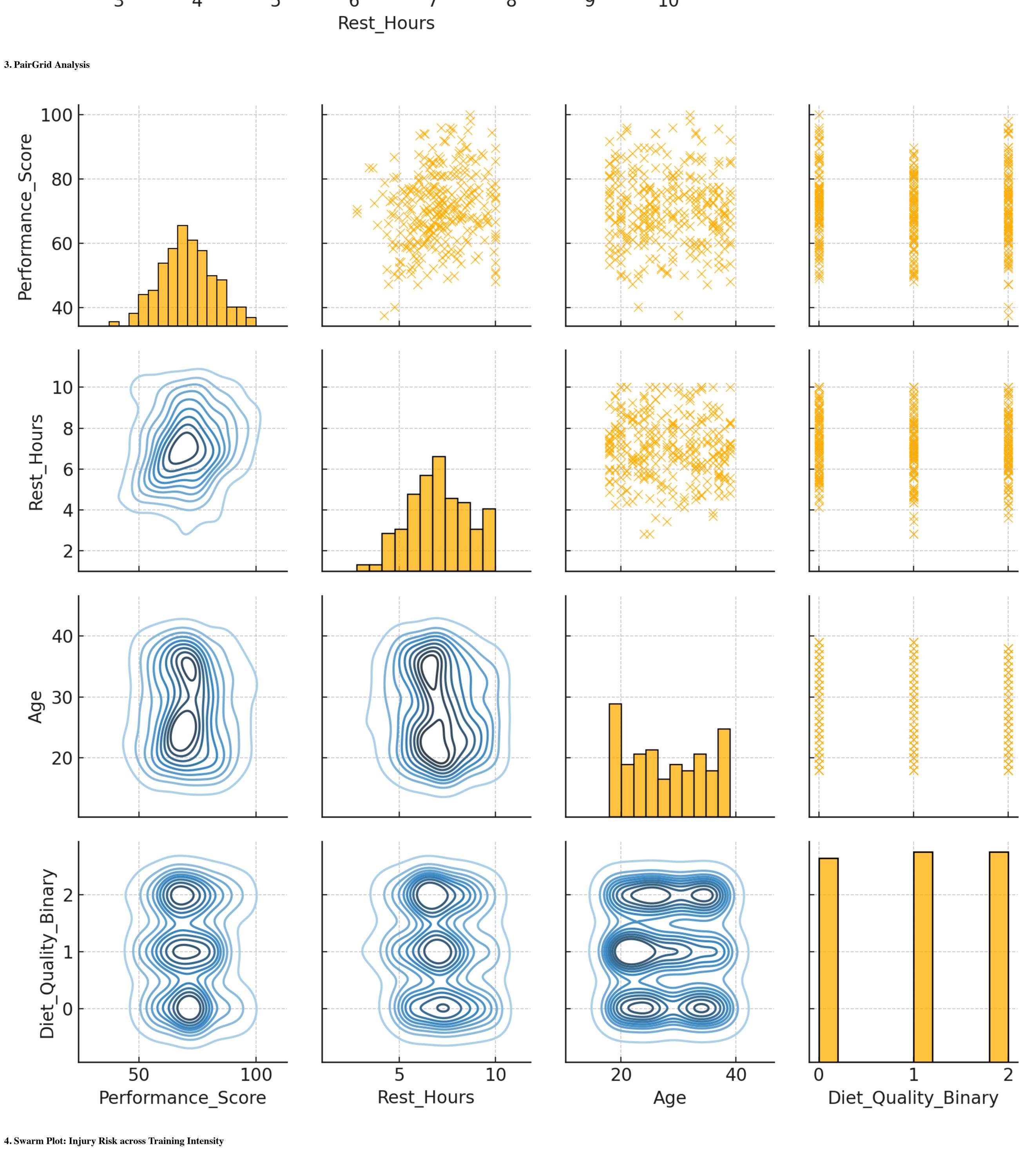




60

50

30



Swarm Plot: Injury Risk across Training Intensity Injury\_Risk 100 90 Score Performance 60 50 Medium High Low Training\_Intensity **Summary and Recommendations**