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| Metric | Formula | Description | Use Case |
| MAE |  | Measures the average magnitude of errors in a set of predictions, without considering their direction | Used to evaluate the accuracy of regression models |
| MSE |  | Average of squared errors between actual and predicted values | Penalizes larger errors more than MAE |
| RMSE |  | Square root of the average of squared errors | Further amplifies the impact of larger errors, preferred for this problem |

| **Regressor** | **Mean Validation RMSE** |
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| Linear Regression | 2.3738 |

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| Decision Tree Regressor | 2.3599 |

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| Random Forest Regressor | 1.7387 |

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| Ridge Regressor | 2.3774 |

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| Lasso Regressor | 2.7925 |

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| XGBoost Regressor | 1.8680 |

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| ANN Regressor | 3.3768 |

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| **Regressor** | Mean Validation RMSE |
| Linear Regression | 2.3738 |
| Decision Tree Regressor | 2.3599 |
| Random Forrest Regressor4 | 1.7387 |
| Ridge Regressor | 2.3774 |
| Lasso Regressor | 2.7925 |
| XG Boost Regressor | 1.8680 |
| ANN Regressor | 3.3768 |

**Random forest Regressor has performed the best**

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| --- | --- |
| METRICS | VALUE |
| Test RMSE | 1.86830155234851 |

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| **Feature Set** | **Description** | **RMSE (kW)** |
| Original Features | Initial set of raw features from the dataset (Ambient Temperature, Module Temperature, Irradiation, AC Power, DC Power) | 3.376760 |
| Engineered Features | After applying transformation and selection (Time of Day [created from timestamp], Bins [based on Block no.], all numeric features) | 1.738688 |

Examining the data head provides insight into the range of values and initial trends within the dataset.