**AI ML Internship Log**

# Day 12 -Hyperparameter Tuning & Final Model Selection

# Date - 01 July 2025

# Team Role - Member

# Project Title - Personality Prediction from Social Media

**📌 What I Did Today:**

* Performed hyperparameter tuning using RandomizedSearchCV on both Linear SVM and SVM with RBF Kernel
* Used class\_weight='balanced' to handle class imbalance and evaluated performance.
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* Conducted final model evaluation across all experiment

**🔧 Problems & Challenges Faced:**

* RBF tuning took a long time to execute (~16 mins), making experimentation slower.
* Some tuning didn’t yield significant improvement, which was a little disappointing.
* Needed to verify if tuning improved metrics or not — required careful result logging.

**📊 Final Results Summary (class\_weight='balanced'):**

| **Models** | **Accuracy** | **Macro F1** | **Weighted F1** |
| --- | --- | --- | --- |
| Logistic Regression | ✅0.65 | ✅0.52 | ✅0.65 |
| Linear SVM | 0.60 | 0.47 | 0.61 |
| SVM RBF | ✅0.65 | ✅0.52 | 0.64 |
| Linear SVM (Tuned) | 0.63 | 0.52 | 0.65 |
| SVM RBF (Tuned) | 0.64 | 0.52 | 0.64 |

**✅ Conclusion & Model Selection:**

**Logistic Regression** was finalized as the best model:

* Equal or higher accuracy and F1 scores.
* Fast, interpretable, and stable.
* Advanced tuning gave little benefit beyond logistic regression performance.
* **Macro F1 improvement (from 0.46 → 0.52)** shows better fairness across personality types.

**🧠 Self-Reflection:**

* Though accuracy didn’t improve massively, I learned that in NLP projects with messy, imbalanced data, **even small improvements are meaningful**.
* I now understand hyperparameter tuning, its value, and limitations
* Feeling more confident about final model selection.
* **Status:** Final model selected ✅ | Tuning Completed ✅ | Evaluation ✅