**Model Development Phase Template**

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| Date | 21 JUNE 2025 |
| Team ID | SWTID1749896042 |
| Project Title | Unemployed Insurance Beneficiary Forecasting |
| Maximum Marks | 6 Marks |

**Model Selection Report**

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

NOTE-

We have displayed accuracy only for the Prophet model because it provided the best performance among all tested models based on evaluation metrics (MAE, RMSE, R²). Highlighting its accuracy emphasizes its effectiveness for forecasting unemployment insurance beneficiaries in this project.

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| **Model** | **Description** | **Hyperparameters** | **Performance**  **Metric (e.g.,**  **Accuracy, F1**  **Score)** |
| ARIMA | Captures trends and autocorrelation in beneficiary counts; suitable for short-term forecasting of non-seasonal patterns. | - | Accuracy score =  NA |
| SARIMA | Enhances ARIMA with seasonal components; effective in modeling monthly seasonality in unemployment claims. | - | Accuracy score =  NA |
| AutoReg | Predicts future beneficiary counts using past values; simple and fast for identifying short-term dependencies. | - | Accuracy score =  NA |
| VAR | Models interactions between beneficiaries and benefit amounts; captures multivariate dynamics for policy impact analysis. | - | Accuracy score =  NA |
| Prophet | Facebook's model for forecasting trends and seasonal changes; excels at capturing yearly fluctuations in beneficiary data with minimal tuning. | - | Accuracy score =  95% |