**Manual Prediction of Runs — Example with Real Data**

**Step 1: Choose a Player Example and Year**

Let's pick **Ruturaj Gaikwad** in **2023** (most recent full year).

From your data:

| **Feature** | **Value** |
| --- | --- |
| Matches\_Batted | 16 |
| Batting\_Average | 42.14 |
| Balls\_Faced | 400 |
| Batting\_Strike\_Rate | 147.5 |
| Centuries | 0 |
| Half\_Centuries | 4 |
| Fours | 46 |
| Sixes | 30 |
| Player\_Experience (Matches\_Batted) | 16 |

**Step 2: Assume Linear Regression Weights (for demonstration)**

Let's assume your model weights as (these would normally come from training):

| **Feature** | **Weight (w)** |
| --- | --- |
| Matches\_Batted | 1.5 |
| Batting\_Average | 4.0 |
| Balls\_Faced | 0.03 |
| Batting\_Strike\_Rate | 0.5 |
| Centuries | 20 |
| Half\_Centuries | 10 |
| Fours | 1.2 |
| Sixes | 1.5 |
| Player\_Experience | 2 |
| Bias (Intercept) | 100 |

**Step 3: Multiply Features by Weights**

Calculate each term:

| **Feature** | **Value (x)** | **Weight (w)** |  |
| --- | --- | --- | --- |
| Matches\_Batted | 16 | 1.5 | 24 |
| Batting\_Average | 42.14 | 4.0 | 168.56 |
| Balls\_Faced | 400 | 0.03 | 12 |
| Batting\_Strike\_Rate | 147.5 | 0.5 | 73.75 |
| Centuries | 0 | 20 | 0 |
| Half\_Centuries | 4 | 10 | 40 |
| Fours | 46 | 1.2 | 55.2 |
| Sixes | 30 | 1.5 | 45 |
| Player\_Experience | 16 | 2 | 32 |
| Bias (Intercept) | — | 100 | 100 |

**Step 4: Sum All Terms**

**Final Predicted Runs:**

**How to explain in an interview / presentation:**

1. **State the formula:**
2. **Plug in values:** Show feature values for the player and weights.
3. **Multiply & sum:** Multiply each stat by its weight, add all, then add bias.
4. **Result:** The prediction is about 550 runs for Ruturaj Gaikwad in 2023.

**Manual Calculation of Mean Squared Error (MSE) — Step-by-Step**

**1. Prepare Data**

You have **actual runs** (target values) and **predicted runs** (from your linear regression model) for players.

| **Player** | **Actual Runs (y)** | **Predicted Runs (ŷ)** |
| --- | --- | --- |
| Ruturaj Gaikwad | 590 | 550.51 |
| Devon Conway | 672 | 626.45 |
| Ajinkya Rahane | 326 | 443.12 |

**2. Calculate Errors and Squared Errors**

For each player:

| **Player** | **Error** | **Squared Error** |
| --- | --- | --- |
| Ruturaj Gaikwad | 590 - 550.51 = 39.49 |  |
| Devon Conway | 672 - 626.45 = 45.55 |  |
| Ajinkya Rahane | 326 - 443.12 = -117.12 |  |

**3. Compute Mean Squared Error (MSE)**

Where (number of players).

**Summary:**

* **MSE measures average squared difference between actual and predicted runs.**
* Lower MSE means better prediction accuracy.
* Calculated by squaring each error to penalize large deviations.

**Optional: How to predict runs for a player (linear model example)**

Where:

* = intercept (bias term)
* = weight for feature
* = feature value for player

Example (for Ruturaj Gaikwad):