

# TrackTempo AI: Post-Race Evaluation Expansion

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## 1. Post-Race SP Enrichment

- Join post-race data to pre-race model-ready DataFrame.
- Match on: race\_date + course + off\_time + horse name.
- Add fields:
  - 'pos' -> Final finishing position.
  - 'dec' -> Starting price (decimal odds).

## 2. Model-Implied Odds & Value Signals

- Derive model-implied odds from softmax predictions:

$$\text{model\_odds} = 1.0 / \text{model\_probs}$$

- Compare to SP (decimal odds):
  - beat\_sp\_flag = model\_probs > (1.0 / SP)
  - value\_margin = model\_probs - (1.0 / SP)

- Additional signals:

- model\_rank vs. sp\_rank
- flag for overlays or strong bias signals.

## 3. Evaluation Suite

- Core metrics:
  - Accuracy@1: Top predicted runner wins.
  - Log Loss: Penalize overconfident wrong picks.
  - ROI Simulation: Simulate PnL using top-pick and SP.
  - Calibration Plots: Predicted win bands vs. empirical wins.

- Value-based analysis:
  - Filter races where `value_margin > 0`
  - Analyze expected vs. realized returns

#### Bonus Tools (Future Expansion)

- Embed post-race 'comment' for error diagnosis.
- Model Surprise Index:
  - `abs(model_prob - actual_outcome)`
  - Flags where model is highly confident but wrong.
- Overlay heatmaps and rank-shift diagnostics.