

railway_fraud_rules = [

🕒 Transaction Completion Time-Based Rules

"Rule 1: Flag transactions where completion time is between 15 to 4 minutes. Reason: Typical human interaction duration for a genuine booking. Action: Set Fraudulent Risk to Low. Category: Transaction Completion Time-Based Rules",

"Rule 2: Flag transactions where completion time is between 0 to 4 minutes. Reason: Extremely fast booking completion—potential automated bot activity. Action: Set Fraudulent Risk to High. Category: Transaction Completion Time-Based Rules",

"Rule 3: Flag users whose average transaction completion time over the last 28 days is between 15 to 4 minutes. Reason: Consistent human-like behavior. Action: Set Fraudulent Risk to Low. Category: Transaction Completion Time-Based Rules",

"Rule 4: Flag users whose average transaction completion time over the last 28 days is between 4 to 0 minutes. Reason: Consistently rapid transactions—possible automated booking. Action: Set Fraudulent Risk to High. Category: Transaction Completion Time-Based Rules",

🌐 IP Address-Based Rules

"Rule 5: Flag users with 3 or fewer unique IP addresses used within the last 28 days. Reason: Normal behavior—same IP or few devices used for booking. Action: Set Fraudulent Risk to Low. Category: IP Address-Based Rules",

"Rule 6: Flag users with more than 3 unique IP addresses used within the last 28 days. Reason: Multiple device or proxy usage may indicate account sharing or automation. Action: Set Fraudulent Risk to High. Category: IP Address-Based Rules",

📅 Transaction Frequency / Recency Rules

"Rule 7: Flag users whose time since last transaction is more than 3 or 4 days. Reason: Normal gap between bookings—typical travel planning pattern. Action: Set Fraudulent Risk to Low. Category: Transaction Frequency-Based Rules",

"Rule 8: Flag users whose time since last transaction is less than 3 or 4 days. Reason: High booking frequency may indicate automated ticket purchase attempts. Action: Set Fraudulent Risk to High. Category: Transaction Frequency-Based Rules",

"Rule 9: Flag users with no previous transactions (time since last transaction = -1). Reason: New user—no prior suspicious history. Action: Set Fraudulent Risk to Low. Category: Transaction Frequency-Based Rules",

📅 Weekly Transaction Behavior Rules

"Rule 10: Flag users whose average transactions per week range between 0.22 and 2.04. Reason: Normal ticket purchase frequency for genuine travelers. Action: Set Fraudulent Risk to Low. Category: Weekly Transaction Behavior Rules",

"Rule 11: Flag users whose average transactions per week range between 0.3 and 9. Reason: Abnormally high weekly activity—potential bulk or automated purchases. Action: Set Fraudulent Risk to High. Category: Weekly Transaction Behavior Rules",

👤 Dependent Ticket Behavior Rules

"Rule 12: Flag transactions with 0 to 3 dependent tickets. Reason: Typical number of dependent passengers for genuine users. Action: Set Fraudulent Risk to Low. Category: Dependent Ticket Behavior Rules",

"Rule 13: Flag transactions with 3 to 4 dependent tickets. Reason: Higher dependent count may indicate ticket reselling behavior. Action: Set Fraudulent Risk to High. Category: Dependent Ticket Behavior Rules",

"Rule 14: Flag users whose average dependent transaction ratio over the last 28 days ranges between 0.41 and 0. Reason: Balanced, human-like dependent booking behavior. Action: Set Fraudulent Risk to Low. Category: Dependent Ticket Behavior Rules",

"Rule 15: Flag users whose average dependent transaction ratio over the last 28 days ranges between 1 and 0.5. Reason: Excessive dependent usage—possible fraudulent bulk booking. Action: Set Fraudulent Risk to High. Category: Dependent Ticket Behavior Rules",

🎫 Ticket Count-Based Rules

"Rule 16: Flag transactions where number of tickets per transaction ranges between 1 and 3 or 4. Reason: Normal passenger booking behavior. Action: Set Fraudulent Risk to Low. Category: Ticket Count-Based Rules",

"Rule 17: Flag transactions with 4 or 5 tickets. Reason: High-volume purchase per transaction—possible fraud or resale activity. Action: Set Fraudulent Risk to High. Category: Ticket Count-Based Rules",

"Rule 18: Flag users with an average of 1 to 3 tickets per transaction. Reason: Normal booking size for genuine users. Action: Set Fraudulent Risk to Low. Category: Ticket Count-Based Rules",

"Rule 19: Flag users with an average of 4 or 5 tickets per transaction. Reason: Consistently high ticket count per booking—possible automated group booking or ticket hoarding. Action: Set Fraudulent Risk to High. Category: Ticket Count-Based Rules",

🧑 Ticket Class Usage Rules

"Rule 20: Flag users who buy tickets across multiple classes (e.g., Class 1, 2, 3, Observation Saloon). Reason: Diverse travel patterns—normal behavior. Action: Set Fraudulent Risk to Low. Category: Ticket Class Usage Rules",

"Rule 21: Flag users who buy tickets only in Class 1 or Observation Saloon. Reason: Narrow purchase pattern targeting premium classes—possible reseller activity. Action: Set Fraudulent Risk to High. Category: Ticket Class Usage Rules",

🗺️ Route Pattern-Based Rules

"Rule 22: Flag users who consistently book only 'Kandy → Colombo' or 'Colombo → Kandy' routes. Reason: Repeated booking on popular routes—possible automated bulk booking attempt. Action: Set Fraudulent Risk to High. Category: Route Pattern-Based Rules"

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