Warranty Claim Pattern Analysis for Customer Deliveries (dataset attached)

Background

A manufacturing company distributes its products monthly to customers. Each batch of deliveries is tracked for warranty claims over subsequent months. The company wants to analyze historical warranty claim trends to improve product design, forecast future claims, and optimize its warranty policy.

To analyze monthly warranty claim trends relative to delivery volume, identify patterns over time, and assess how the warranty claims develop across months after product delivery.

Data Overview

- **Delivery Month:** The month when products were delivered.
- **Amount of Supplies:** The number of units delivered in each delivery month.
- **Warranty Claims:** Subsequent columns represent the number of warranty claims made in months following the delivery.

Key Insights

1. **Warranty Claim Behavior Over Time:**

Warranty claims tend to peak within the first few months after delivery and taper off over time.

For example, products delivered in January 2023 had 60 claims in February, dropping to 34 by June and eventually to 35 in March 2024.

2. **Claim Proportions Relative to Delivery Volume:**

Initial claim rates (1 month post-delivery) range from 0.9% to 1.2% depending on the delivery batch.

Cumulative claim rate over 13 months ranges between 5% to 8%.

3. **Trend Variations by Delivery Batch:**

Some delivery months show higher early claim rates (potential quality issues).

E.g., February 2023 shows a spike to 67 claims in March, while March deliveries had delayed peaks.

Questions for discussion and solution

1. What is the average cumulative warranty claim rate over a 12-month period for each delivery month?
2. In which month after delivery (e.g., 1st, 2nd, 3rd month, etc.) do most warranty claims typically occur?
3. How do warranty claim patterns vary between larger (e.g., >6000 units) and smaller deliveries (e.g., <5000 units)?