Task 2: Customer Support Ticket Analysis – Future Interns

# 🧭Objective Summary

The purpose of this task was to analyze a dataset of customer support tickets to uncover frequent issues, evaluate efficiency in response and resolution, and suggest actionable improvements. Python was used for the analysis, leveraging libraries such as **Pandas**, **Matplotlib**, **Seaborn**, and **NLTK**.

# 📁 Data Points Analyzed

The following key data fields were used in the analysis:

* Customer Issue Descriptions
* Ticket Urgency Level
* Channel Through Which Ticket Was Submitted
* Initial Response Time
* Total Resolution Duration
* Customer Feedback Ratings

# 📈 Insights & Analysis

**1. Text Mining of Support Descriptions**

* Cleaned and tokenized the text in support tickets, removing common stopwords and punctuation.
* Identified high-frequency terms such as *login*, *reset*, *refund*, and *delay*.
* These terms pointed to common customer concerns around **authentication** and **payment issues**.

**2. Response & Resolution Time Metrics**

* Calculated resolution time using the difference between first response and total resolution time.
* Highlighted tickets exceeding **24-hour resolution windows**.
* Delays were more frequent in low-priority and email-based tickets.

**3. Priority-Based Ticket Trends**

* **Critical priority** tickets were generally resolved quickly but made up a large portion of the workload.
* **Low-priority** tickets were frequently delayed, indicating a mismatch in resource allocation.
* Suggested optimization in agent assignment based on ticket priority.

**4. Support Channel Evaluation**

* **Social media** had the quickest average response time.
* **Email** was the slowest in both response and resolution.
* Differences in response performance suggest the need for consistent service across channels.

**5. Customer Experience Ratings**

* Analyzed satisfaction ratings to measure customer sentiment.
* Lower scores correlated with tickets that had delayed responses or were marked low-priority.

# 🌱 Strategic Suggestions

To enhance customer support performance, the following improvements are recommended:

* **Automate** responses for repetitive issues like login and password recovery.
* **Redistribute workload** dynamically to manage high-volume periods effectively.
* **Improve email handling** through prioritization tools or automation workflows.
* **Implement smart routing** using NLP to assign tickets based on detected keywords.

# 🖼️ Visual Exploration Highlights

The analysis was supported by the following visualizations:

* Ticket Volume by Priority Level
* Most Frequent Keywords in Ticket Descriptions
* Average Resolution Time by Channel
* Customer Satisfaction Score Distribution
* Channel vs. Ticket Priority Heatmap

**🔧 Tools & Techniques**

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