# HackNJIT 2024 Challenge – SM Insights

Star Micronics is thrilled to invite you to participate in the SM Insights challenge. This challenge is your opportunity to apply your technical skills to real-world Point of Sale (POS) data, offering innovative insights to businesses that are normally locked out of SOTA analytics.

During this 24-hour challenge, you’ll work with real POS data and have a chance to create meaningful impact by proposing solutions that improve decision-making, user experience, and data analysis in POS environments.

Whether you’re a computer science student, data science enthusiast, UX designer, or aspiring entrepreneur, this challenge will push you to solve a problem that retailers and service businesses face every day. By leveraging your skills, you can make a measurable impact on how these businesses understand and act on their data.

## Overview

POS systems generate a wealth of data, from transaction logs to customer purchasing patterns. However, many businesses lack the tools to harness these insights effectively. Your mission is to create an application or tool that can process this data, identify actionable insights, and present these in a way that’s intuitive for non-technical users.

## Challenge Statement

Develop a solution that can analyze POS data and uncover patterns or recommendations for store managers, focusing on insights that can improve customer experience, inventory management, and operational efficiency.

## Objectives

* **Insight Generation:** Identify useful insights from POS data, such as high-demand products, peak sales times, or patterns in customer buying behavior. Consider how these insights might inform stock levels, sales forecasting, or promotional strategies. Get creative with how you connect the dots using AI, data from other APIs, or other existing tools
* **Data Visualization:** Create visual representations (e.g., charts, graphs, dashboards) that make it easy for users to understand trends and patterns at a glance. You might use a dashboard to showcase key metrics or even recommend actions based on the data.
* **User-Friendly Design:** Ensure the interface is intuitive and accessible to non-technical users. Think about ease of navigation, readability, and the overall user experience.

## Tools & Technology Recommendations

We suggest languages like Python, JavaScript, or R for data handling. Libraries such as Pandas for data processing, plotly.py for visualization, and frameworks like Flask or Django for web-based applications could be useful.

## Data Access & Documentation

We’re providing datasets that include anonymized POS transaction details, sales trends, and inventory information. You can access these datasets directly through Dropbox. Use this data to create models, dashboards, or tools to generate insights.

* [**Download POS Data on Dropbox**](https://www.dropbox.com/scl/fo/5flr6yelutvloo42ukmt3/APh5zpeUba9KHWd61IaLktw?rlkey=iob3adyho824987up5ws499zy&dl=0) – Access real transactional data gives you a realistic challenge, with plenty of room to explore patterns and trends.
* **[Star Document Markup Language (SDML) Manual](https://star-m.jp/products/s_print/sdk/StarDocumentMarkup/manual/en/index.html)** – Use this guide to interpret receipt data from Star Micronics printers. This documentation covers Star Document Markup, allowing you to extract and display receipt information accurately in your projects.

## What we are looking for:

* **Innovation**: Does your solution take a unique approach to POS insights? Are you presenting new ways to process and interpret data?
* **Functionality and Relevance**: Does the solution address real business needs? How effectively does it provide insights to non-technical users?
* **User Experience**: Is your interface intuitive and accessible? Could a store manager or business owner navigate and understand it without a technical background?
* **Presentation Quality**: Communicate your solution’s potential impact. Explain its relevance and showcase your results with clarity and confidence.

## FAQs

**Q: Can we use any external libraries or tools?**

A: Absolutely! Feel free to use any libraries or frameworks that will help you build the best solution. Just make sure to document what you’ve used.

**Q: What kind of data can we expect?**

A: The data will include anonymized POS receipts and kitchen tickets with products, timestamps, and other fields relevant to analyzing sales trends and customer behavior. Our documentation provides further details on data structure.