

PRACTICAL DATA SCIENCE ON PYTHON

Department of Computer Science and Information Engineering

## Ticket Data Analysis - Girl Generation Data

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*Marking a milestone in their musical journey, the renowned South Korean girl band SNSD (Girls' Generation) embarked on their inaugural Asian concert tour, 'Into the New World'. One of the highlights of this tour was their performance at the Taipei Arena in Taiwan on October 17, 2010. This report delves into the memorable moments and intricate details of this concert. Leveraging a comprehensive dataset from the concert's ticketing system, we aim to unravel the nuances of the event and gain deeper insights into the audience's behavior and preferences.*

## The Data

The dataset at our disposal contains 7,069 entries, each described by 30 distinct variables. These variables are meticulously labeled to convey clear meanings. For the scope of our analysis, we will focus on the following key variables:

- **T\_STANDARD\_TICKET\_TYPE\_NAME:** This column categorizes each ticket by its type, primarily differentiating between 'member' and 'non-member'.
- **SEAT\_REGION\_NAME:** This variable indicates the specific location of each seat within the arena.
- **SEX:** The gender of the ticket purchaser is denoted in this column as 'male' or 'female'.
- **CREATE\_DATE:** The exact date and time of each ticket purchase are recorded in this field.

## Task

Our objective is to extract meaningful insights regarding the disparity in ticket sales among different zones, segmented by gender, and membership status.

We will define and apply the concept of 'sales speed' to each zone. This will involve a careful and creative explanation of how 'sales speed' is quantified and interpreted.

Utilizing our definition of 'sales speed', we will compare and contrast ticket sales across different zones. Our goal is to unearth intriguing patterns and insights from these comparisons.

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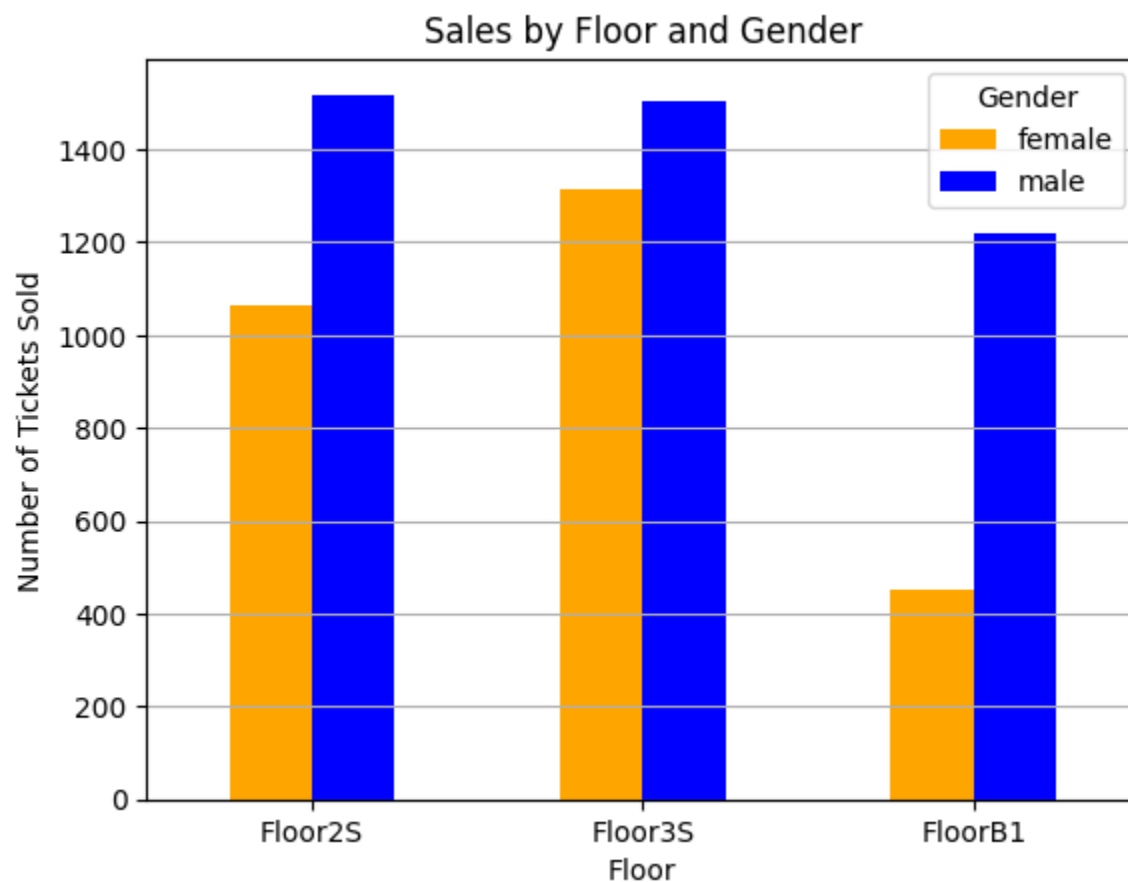
The code is on github at :

<https://gist.github.com/ObNitram/794010676ae5aba09e96896a030b326f>

## TASK 1

In this task, we must find any insights about the number of sales in different zones between males and females, and members and non-members at this concert. We are first interested in the sales of women and men. We have compared each level, and then we compared each section for each level. After that, we did the same with members and non-members. Finally, we sought to understand if there were any links between being a member and being a woman or a man.

### Sex analyse



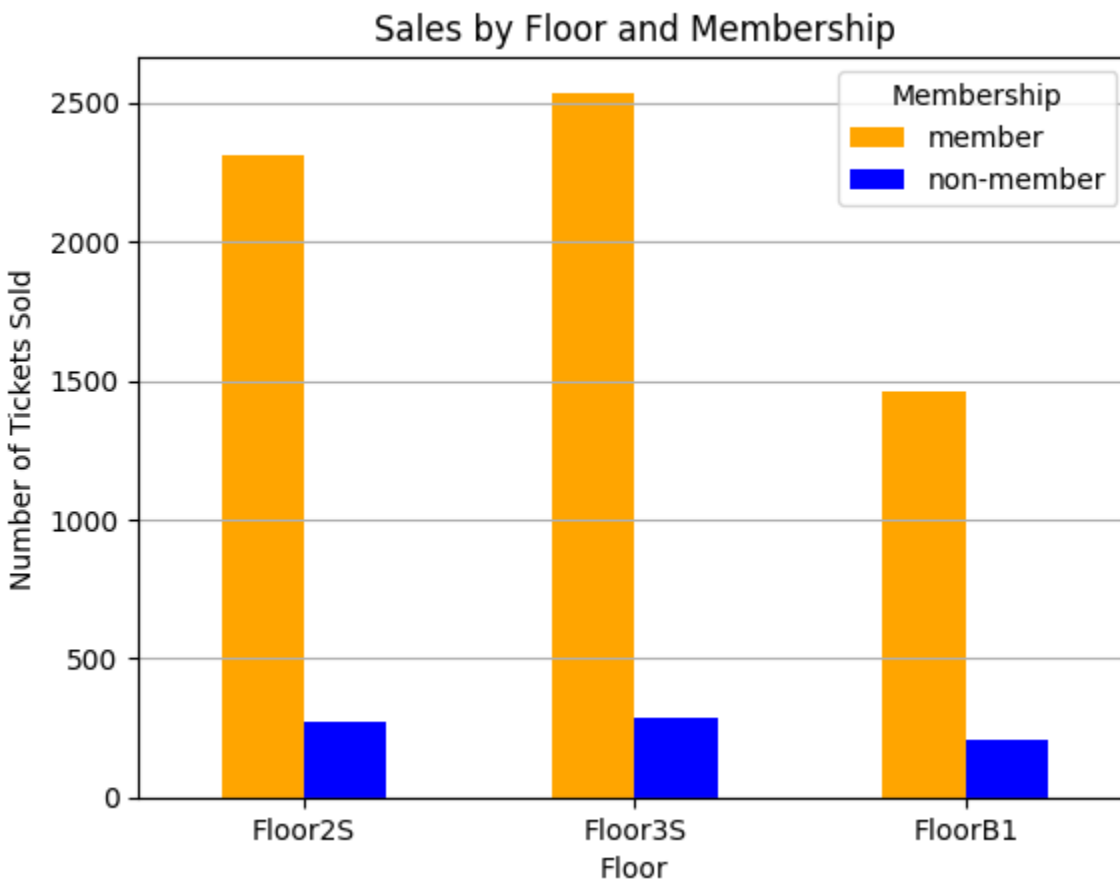
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### Observation:

There were significantly more men than women present at the concert. However, on floor B1, the disparity between men and women was even more pronounced.

The first floor, being closer to the stage and thus offering a closer view of the performers, may explain why there were more men in this area compared to women. Additionally, women may not favor the pit area (the standing area near the stage) as it tends to be more crowded and can sometimes become rough or violent.

### **Membership analyse**



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### Observation:

There was a significantly higher number of members than non-members at the event. Notably, Floor 3, Sections Yellow 3E and Yellow 3F, were almost entirely occupied by members.

Members were given early access to ticket purchases, which resulted in a limited number of tickets being available to non-members later on. The seats in Floor 3, Sections Yellow 3E and Yellow 3F, are desirably positioned (directly in front of the stage) and are more affordable compared to those on Floors B1 and 2. This explains why these sections were predominantly chosen by members.

## **TASK 2**

In this task, we must define the 'sales speed' for each zone and provide details about how our group will determine this 'sales speed'.

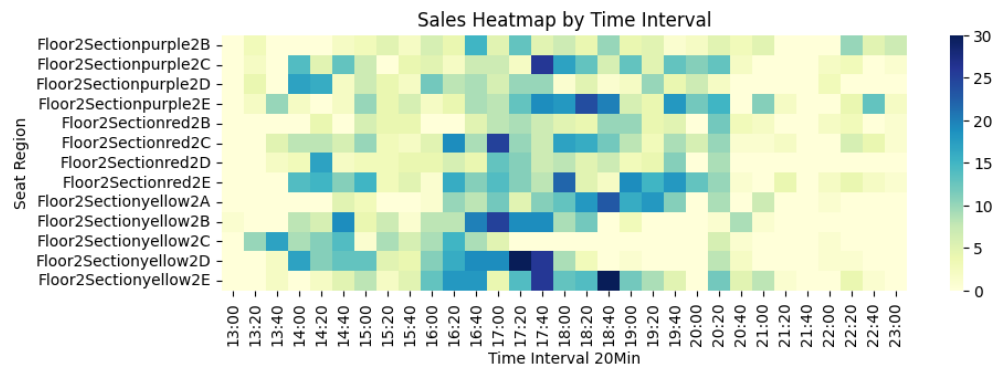
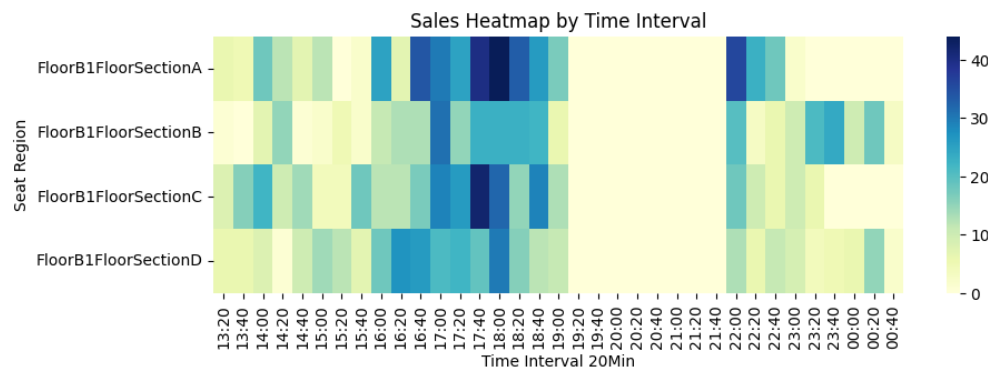
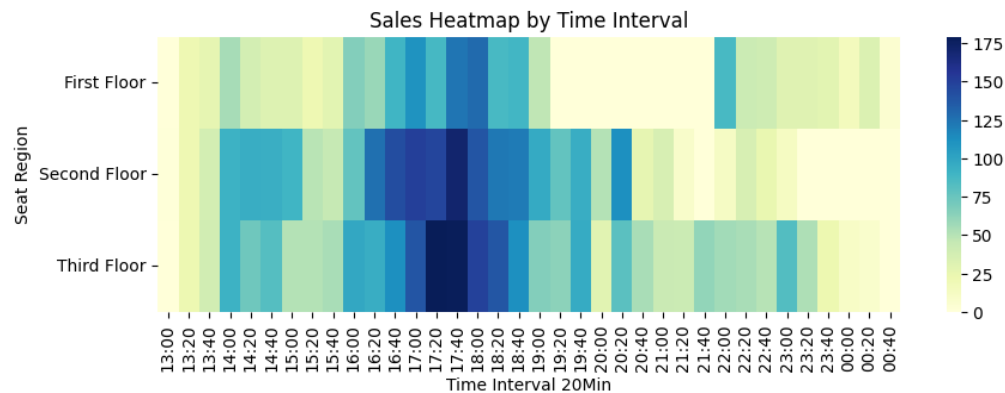
Upon analyzing the data, we noticed that the ticket sales occurred in two distinct phases: an initial presale phase exclusive to members, followed by a second phase open to non-members. It was observed that the presale for members exhausted 80% of the total ticket stock. Consequently, there were only a limited number of tickets left for non-members. Moreover, since these two sales phases occurred two weeks apart, we decided to analyze them separately.

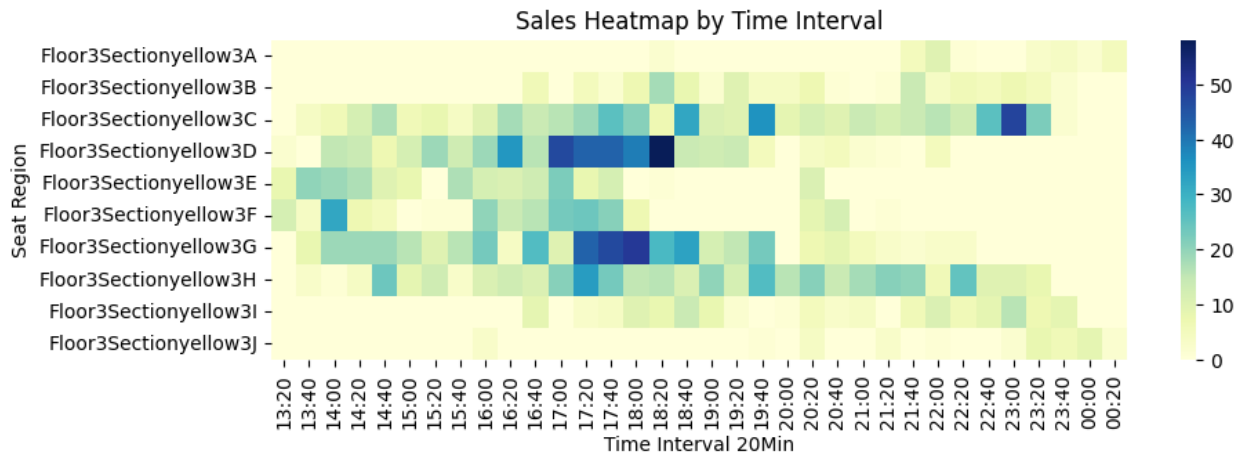
To better understand the dynamics of the sales process, we defined 'sales velocity' as the number of tickets sold per unit of time. For the first phase (members' presale), this was calculated over 15-minute intervals, reflecting the rapid pace of sales during this period. In contrast, for the second phase (open to non-members), we used 3-hour intervals, as the sales during this phase were notably slower. This difference in sales velocity between the two phases can be attributed to the high demand and quick response from members during the initial presale.

### TASK 3

In this task, we use our defined 'sales speed' to compare the ticket sales across different zones. Similar to our analysis in the first part, we first compared the sales speed for each floor, and then for each section of every floor.

#### Pre-sale with member





### Observation:

The seats on the B1 floor experienced less demand and slower sales growth compared to other areas. We observed that the sales speed gradually increased until 18:00, after which it started to decline.

Interestingly, there were no ticket sales on floor B1 from 19:15 to 22:00, which is peculiar.

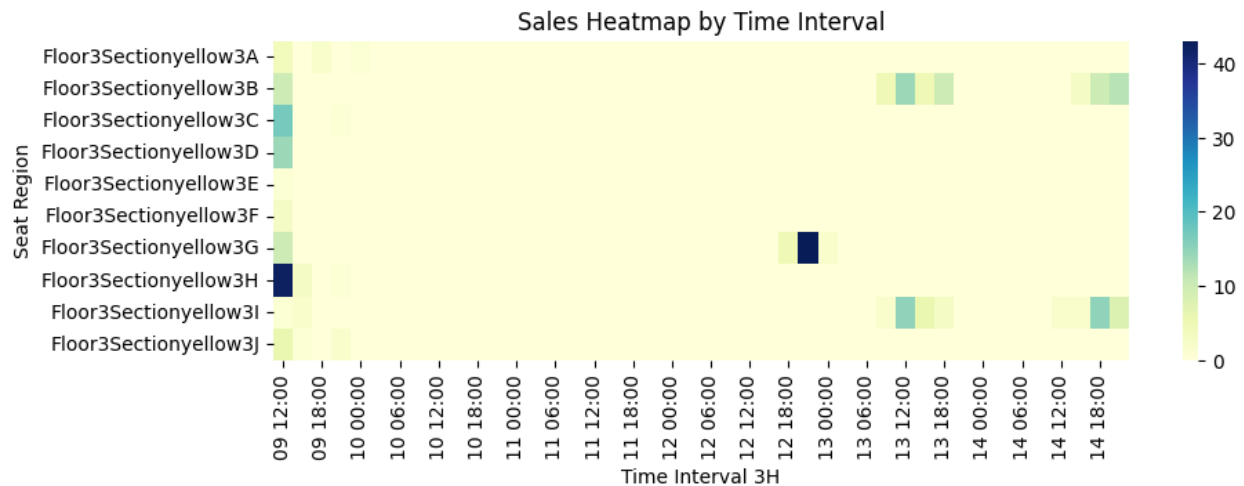
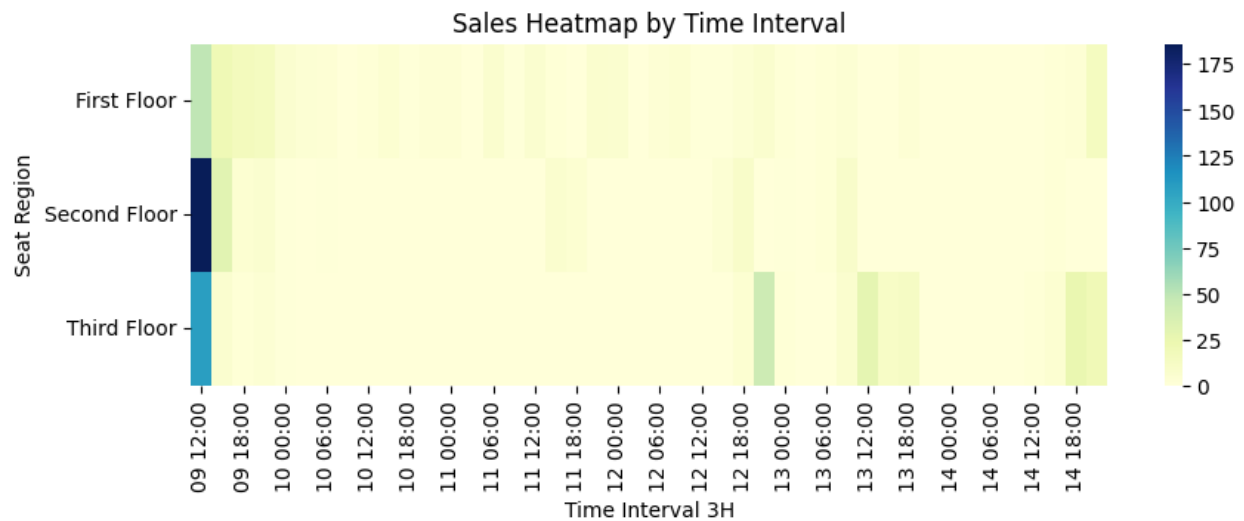
Regarding the second floor, it's noteworthy that the sales were approximately equivalent across all its sections.

Additionally, there was a notable symmetry in the sales across zones on the third floor. It appears that members initially prioritized purchasing middle-section seats, and then progressively moved on to buying seats on the sides.

The seats on the first floor were priced higher, which likely led the majority of concertgoers to opt for seats on the other floors rather than those on the first floor.

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## Non-member sale



### Observation:

It's noticeable that the majority of sales occurred during the initial hours. Afterward, the sales gradually tapered off over the following days until all the seats were sold out. Additionally, there was a significant purchase that stands out, particularly in the third floor's Section 3G. It seems that someone bought about ten tickets in one go.



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## Tasks Distribution

Tasks	Martin	Stanley
<b>Report</b>		
Report Structuring	X	X
Introduction Contextualization		X
Discussion Interpretation	X	X
Correction Improvement	X	
<b>Code</b>		
First Data Analyse	X	
Task 1		X
Task 2	X	
Overall Reviews and Commentary		X

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## Conclusion

Throughout this analysis, several key insights have emerged about the ticket sales dynamics for the SNSD concert at the Taipei Arena. One of the most striking findings is the rapid sales pace during the initial hours, indicating a high initial demand, which then gradually decreased over subsequent days until all seats were sold. This pattern underscores the fervent anticipation and eagerness of the concert's audience.

The sales distribution across different floors and sections of the arena revealed distinct preferences and behaviors among the concertgoers. Notably, the B1 floor experienced less demand and slower sales growth compared to other areas, possibly due to higher ticket prices. A peculiar observation was the complete halt in sales on floor B1 from 19:15 to 22:00, suggesting a saturation point or a shift in buyer focus.

The second floor showed a balanced distribution of sales across its sections, indicating a uniform appeal. In contrast, the third floor displayed an interesting symmetry in ticket purchases, with members initially focusing on the middle-section seats before moving to the sides. This pattern could reflect a strategic approach by members to secure the most desired views.

A significant bulk purchase in Section 3G on the third floor was also noted, highlighting an instance of collective or bulk buying behavior, which could be attributed to group attendance or reselling intentions.

In conclusion, this analysis not only provides a detailed understanding of the ticket sales trends and patterns for the concert but also offers valuable insights into the preferences and behaviors of the audience segments. These findings could be instrumental for future event planning and marketing strategies, especially in targeting specific audience groups and optimizing ticket pricing and sales approaches.