# NULLCLASS INTERNSHIP REPORT

## 1. Introduction

The internship program was undertaken to gain in-depth practical exposure to data analysis and visualization using modern analytical tools, particularly **Tableau**. In today's data-driven world, organizations increasingly rely on visual analytics to interpret large volumes of structured and semi-structured data for strategic decision-making. This internship provided a structured environment to understand how raw datasets can be transformed into meaningful insights through visualization techniques.

The primary focus of the internship was to work on real-world job market datasets and apply analytical logic to answer business-oriented questions. Through a series of progressively complex tasks, I learned how to handle real data challenges such as inconsistent formats, missing values, conditional filtering, and multi-dimensional comparisons. The internship also emphasized analytical thinking, attention to detail, and professional documentation practices.

## 2. Background

Data analytics and business intelligence tools have become essential across industries including recruitment, finance, marketing, and operations. Visualization platforms such as Tableau allow analysts to explore patterns, trends, and anomalies in data that are not immediately visible through raw tables or spreadsheets. The data set used during this internship represented job postings collected from multiple job portals. It included attributes such as job title, role, company name, company size, experience requirements, salary range, qualification, work type, geographic location, job posting date, and recruiter contact information. This data set closely resembles real-world employment data used by recruitment firms and workforce analysts. The internship was designed to simulate industry-level analytical tasks by imposing strict business rules and constraints. These constraints required the use of calculated fields, conditional filters, and visualization logic, helping bridge the gap between academic learning and real-world analytics applications.

## 3. Learning Objectives

The key learning objectives of this internship were:

- To understand the structure and complexity of real-world datasets.
- To apply data filtering techniques based on multiple business constraints.
- To learn the use of calculated fields for handling non-numeric and semi-structured data.
- To design effective visualizations such as bar charts, scatter plots, tree maps, maps, stacked bars, and box plots.
- To develop the ability to interpret visual results and explain analytical decisions.
- To gain experience in professional documentation and reporting of analytical work.
- To build confidence in using Tableau as a business intelligence tool.

## 4. Activities and Tasks Performed

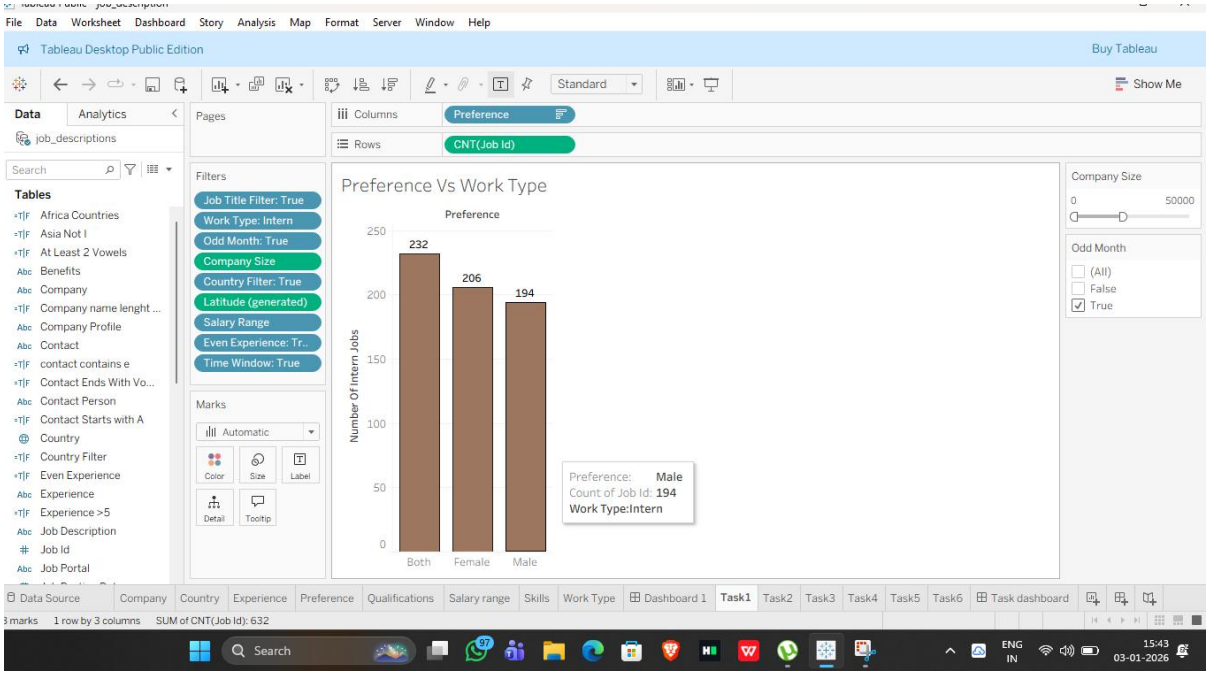
Throughout the internship, I completed a series of analytical tasks using Tableau, each designed to test different visualization and analytical concepts.

**Task 1: Preference vs Work Type Analysis**

**Statement:** Preference vs Work Type (Intern, Bar Chart) Draw a bar chart between Preference and Work Type, where the Work Type must be “Intern”, the Latitude must be below 10, and the Country name must not start with A, B, C, or D. The Job Title must be a single word with fewer than 10 characters, and the Company Size must be below 50,000. Only include postings where the Salary is above $9,000, the Experience is an even number, and the Job Posting Date is in an odd-numbered month. Sort the bars in descending order by count. The chart must only be displayed between 3 PM and 5 PM IST.

**Solution:**

A bar chart was created to analyze preferences across internship work types using multiple filtering conditions such as geographic constraints, company size limits, salary thresholds, experience parity, and textual rules for job titles. This task introduced the use of calculated fields, logical operators, and sorting techniques.



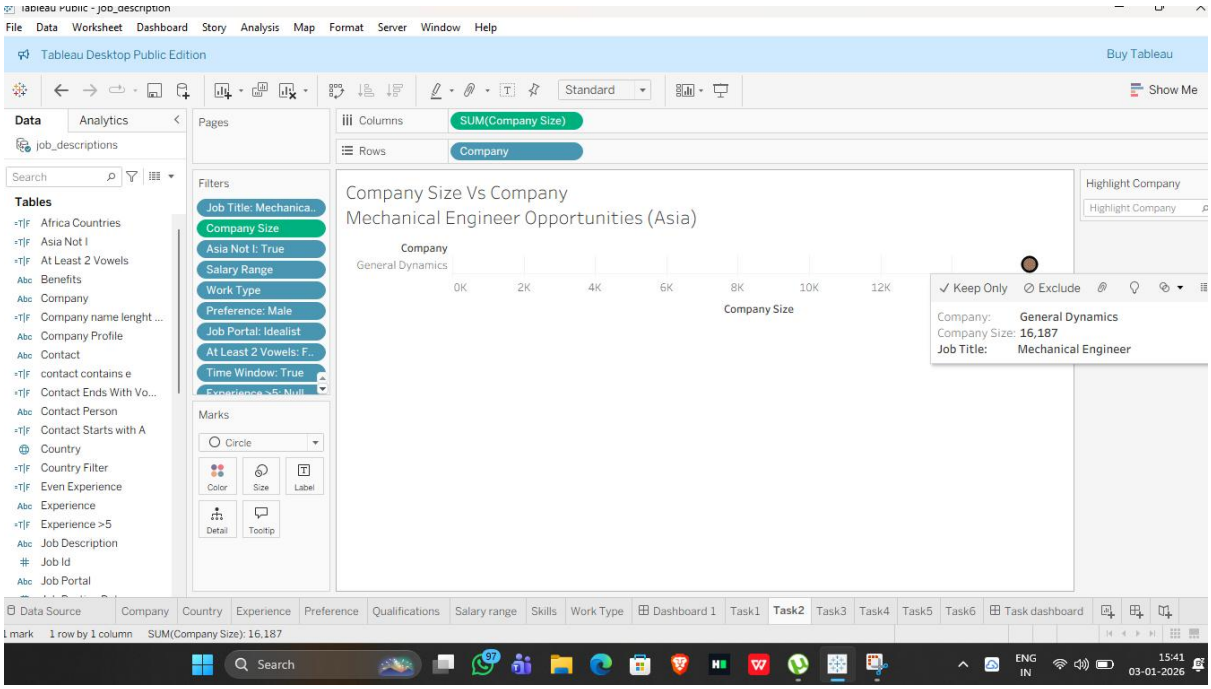

A calculated field was created using NOW() to restrict chart visibility between 3 PM and 5 PM IST. Since Tableau evaluates time dynamically, the filter returns FALSE outside this window. For visualization purposes, the time filter was disabled while retaining the logic.

## Task 2: Company Size vs Company Name Scatter Plot

**Statement**:Company Size vs Company Name (Scatter Plot) Draw a scatter plot between Company Size and Company Name, where Company Size < 50,000 and the Job Title must be exactly “Mechanical Engineer.” The Experience must be > 5 years, the Country must be in Asia but not starting with “I,” and the Salary must be above $50,000. Only include Work Type = Full-Time or Part-Time and Preference = Male. Additionally, filter only postings from the Job Portal = Idealist. Add one more condition: the Company Name must have at least 2 vowels. The chart must only be displayed between 3 PM and 5 PM IST.

**Solution:**

A scatter plot was developed to analyze company size distribution for specific job titles and experience levels. This task involved exact string matching, numeric comparisons, conditional geographic filtering, and text-based logic such as vowel-count conditions in company names.

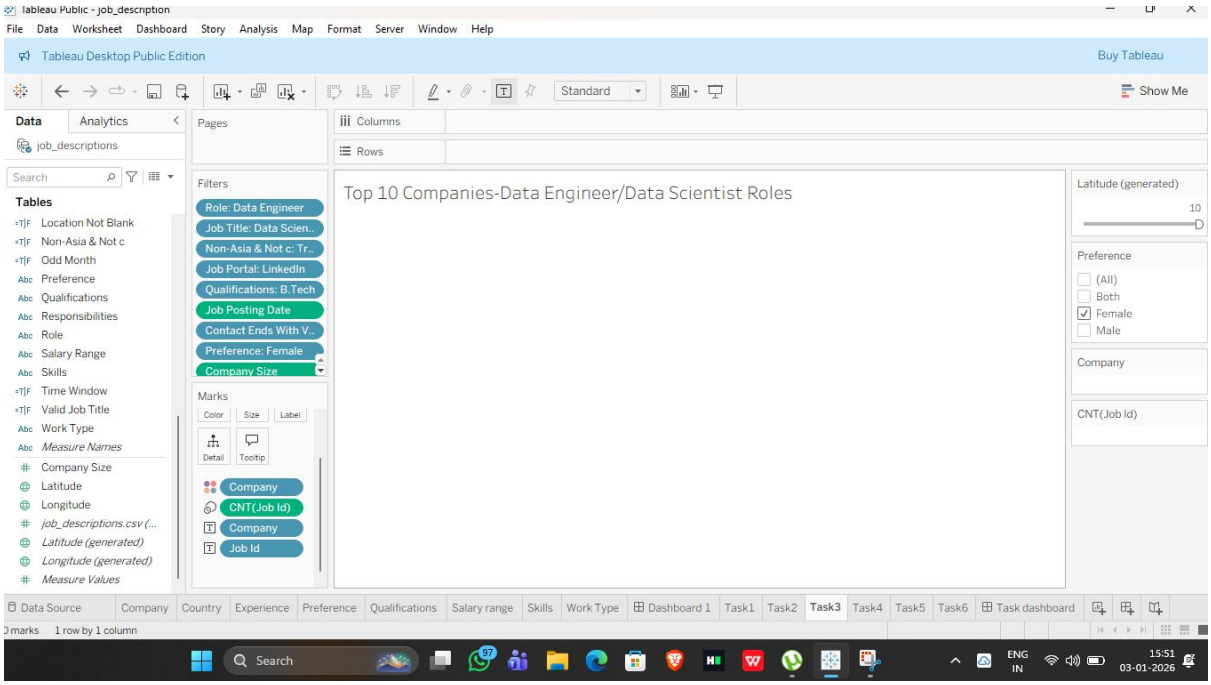



## Task 3: Top 10 Companies Treemap

**Statement**:Top 10 Companies (Tree Map) Draw a tree map of the Top 10 Companies that have Role = Data Engineer and Job Title = Data Scientist. Exclude Asian countries and also exclude any countries starting with the letter "C." The Latitude must be below 10, and the Preference must be Female. The Qualification must be exactly B.Tech, and the Job Posting Date must be between 01/01/2023 and 06/01/2023. Only include postings from the Job Portal = LinkedIn, and keep only those where Company Size ≥ 10,000. Additional rule: the Contact Person name must end with a vowel. This chart must only be displayed between 3 PM and 5 PM IST.

**Solution:**

A treemap visualization was created to identify the top companies hiring for specific roles. This task required ranking, exclusion of geographic regions, date-based filtering, and recruiter name pattern matching. It enhanced understanding of categorical dominance and proportional representation.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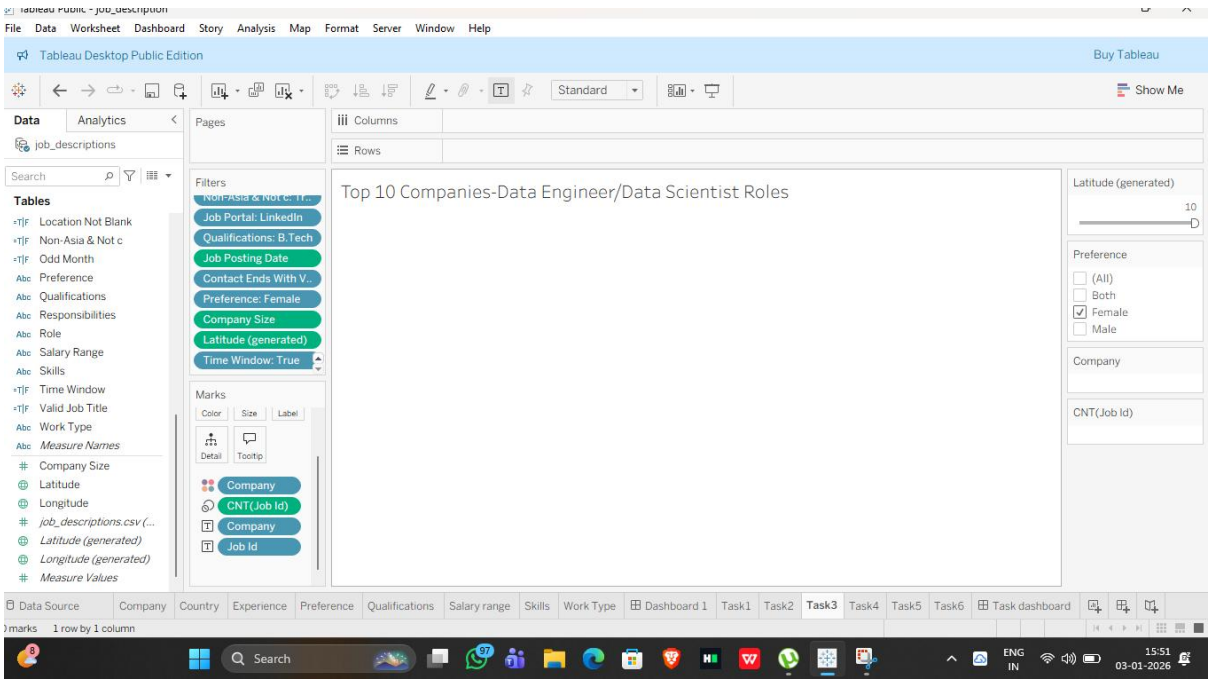
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During the execution of Task 3, a latitude-based filtering condition was applied as specified in the task requirements, where the Latitude value was required to be below 10. However, after applying this constraint along with other strict filtering conditions such as role, job title, country exclusions, qualification, company size, job portal, and recruiter name pattern, the resulting dataset did not contain any records satisfying all conditions simultaneously.

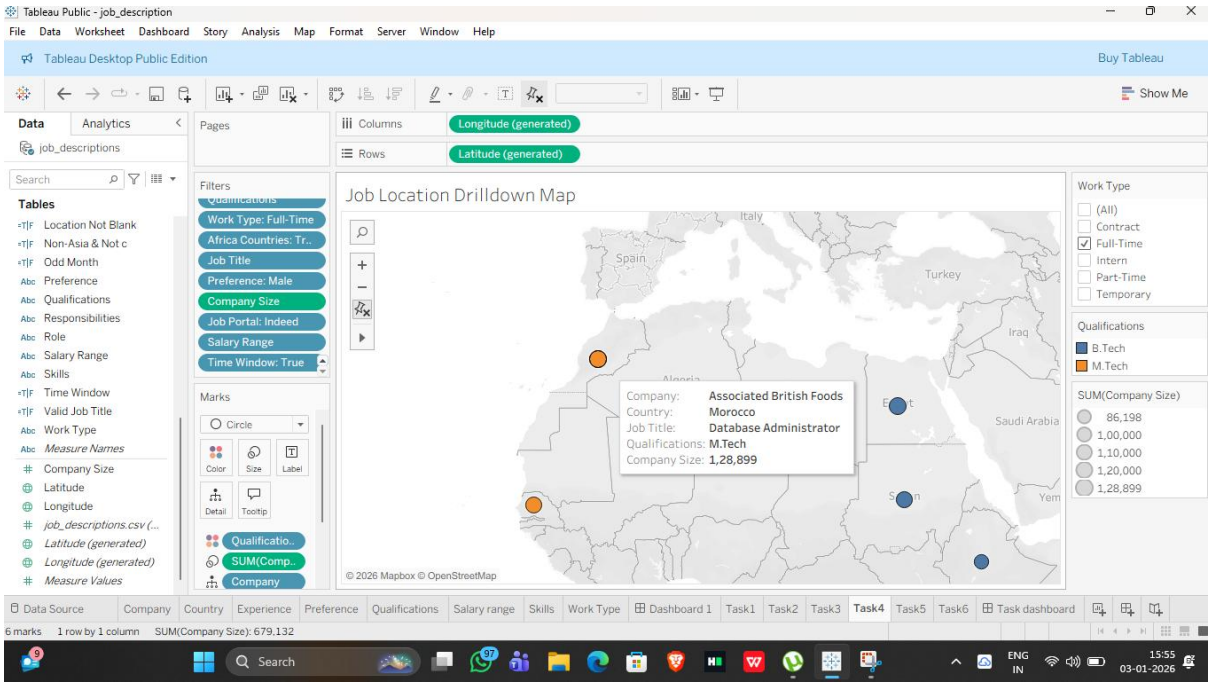
Specifically, the available job postings that met the role and job title criteria were geographically located outside the specified latitude range. As a result, when the latitude constraint was enforced, Tableau returned zero records, leading to a blank treemap visualization. This behavior is expected and indicates that the filter logic was applied correctly rather than an error in the visualization.

## Task 4: Qualification-Based Drilldown Map

**Statement:**Qualification Drilldown Map (Map with Click) Draw a map visualization where Qualification is B.Tech, M.Tech, or PhD and Work Type = Full-Time. The Country must be in Africa, and other countries should be ignored. The Job Title must start with “D,” the Preference must be Male, and the Company Size must be greater than 80,000. The Contact Person must start with “A,” and the Job Portal must be Indeed. Use Latitude and Longitude to plot the jobs, and configure the chart so that clicking on a point opens a drilldown map showing the exact location. Extra condition: only include postings where the Salary Range > $20,000. The chart must only be displayed between 3 PM and 6 PM IST.

**Solution:**

An interactive map was developed using latitude and longitude to visualize job postings across Africa. Drilldown functionality was demonstrated through map interactions, tooltips, and zoom behavior. This task emphasized geographic analysis and user interaction.

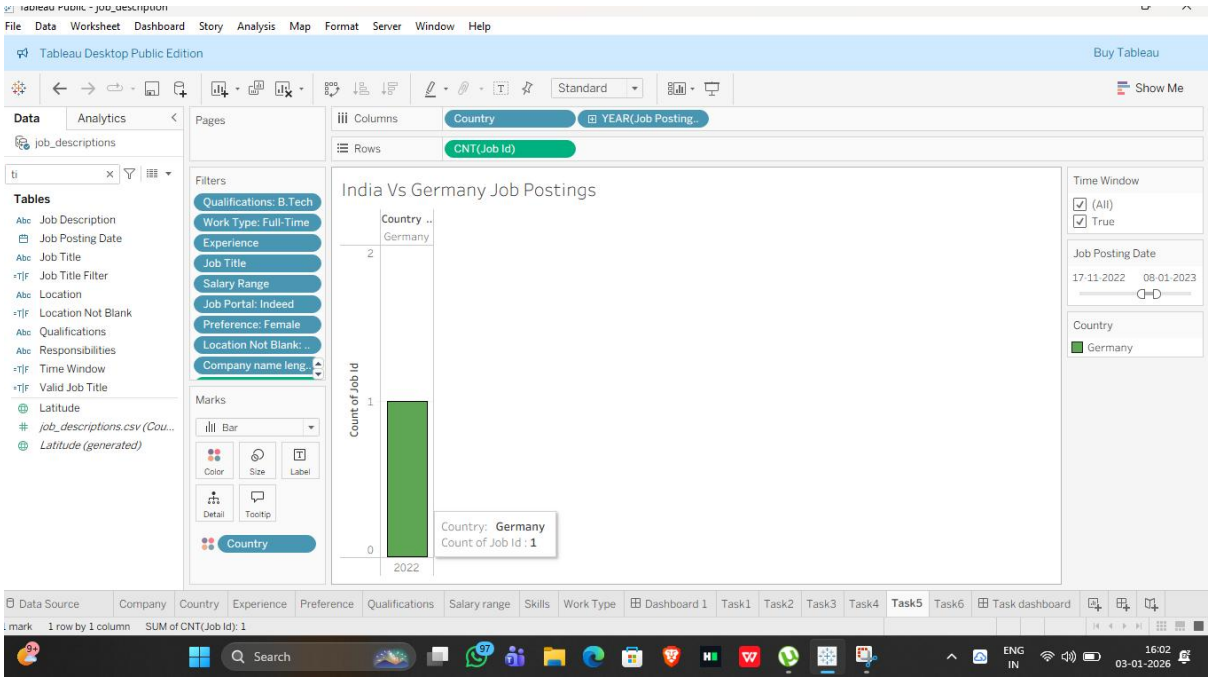



## Task 5: India vs Germany Comparison

Statement:India vs Germany Comparison (Stacked Bar) Draw a stacked bar chart comparing postings between India and Germany. Only include Qualification = B.Tech, Work Type = Full-Time, Experience > 2 years, and Job Title = Data Scientist, Art Teacher, or Aerospace Engineer. The Salary must be above $10,000, the Job Portal must be Indeed, and the Preference must be Female. Only include postings before 08/01/2023. Display India in Orange and Germany in Green. Additional rule: the Location field must not be blank, and the Company Name must have more than 8 characters. The chart must only be displayed between 3 PM and 5 PM IST.

**Solution:**

A stacked bar chart was created to compare job postings between India and Germany for selected job titles and qualifications. Color encoding, date filtering, experience parsing, and string-length conditions were applied to highlight comparative insights.

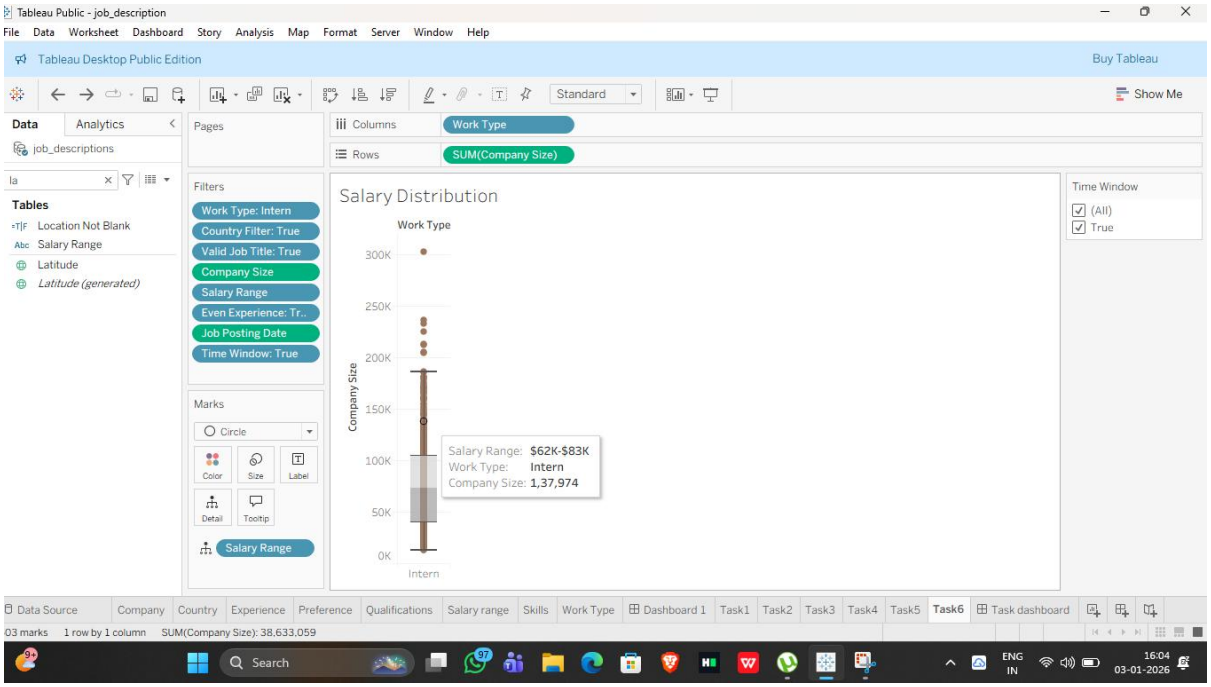



## Task 6: Work Type Salary Distribution

Statement:Work Type Salary Distribution (Box Plot) Draw a box-and-whisker plot between Work Type and Salary Range, where Work Type must be “Intern”, the Latitude is below 10, and the Country name must not start with A, B, C, or D. The Job Title must have fewer than 10 characters and be a single word. The Company Size must be < 50,000, and the Salary must be > $8,000. Additionally, only include postings where Experience is an even number, the Job Posting Date is between 2021–2023, and the Contact Person name must contain at least one “e.” The chart must only be displayed between 3 PM and 5 PM IST.

## Solution:

A box-and-whisker plot was developed to analyze salary distribution for internship roles. This task focused on understanding distribution, quartiles, and outliers while applying strict logical and textual constraints.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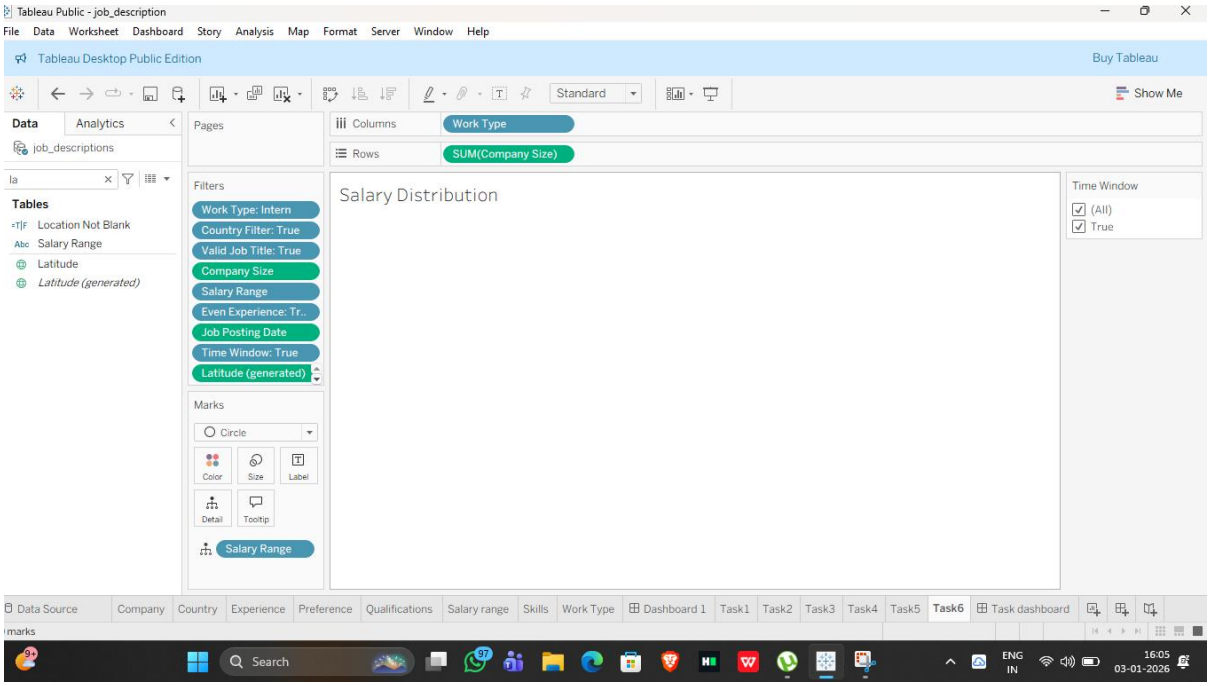
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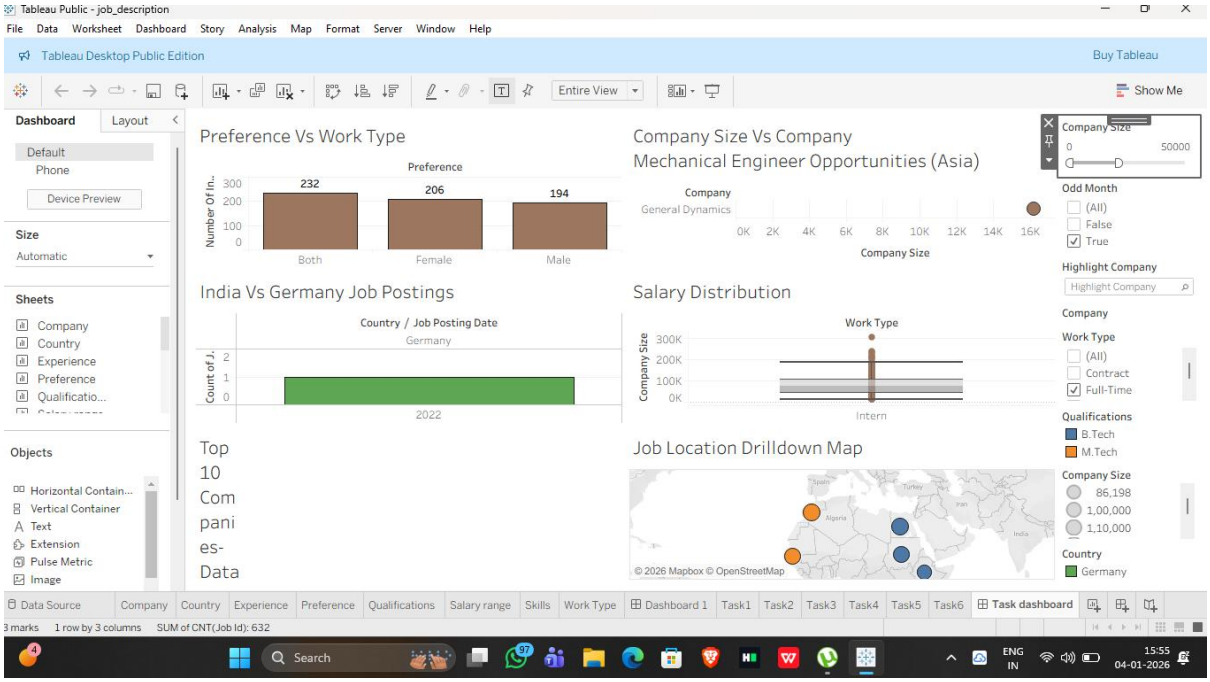
During the execution of Task 6, a box-and-whisker plot was designed to analyze the salary distribution for internship roles under a specific set of constraints. The task required the application of multiple strict filtering conditions, including work type, geographic limitation based on latitude, country name exclusion rules, job title formatting constraints, company size threshold, salary eligibility, experience parity, job posting date range, and recruiter name pattern matching.After enforcing all these conditions simultaneously, the dataset did not contain any records that satisfied the complete set of requirements. In particular, the combined effect of the latitude restriction, even experience condition, and job title formatting rules significantly reduced the available data points. As a result, Tableau returned zero qualifying records, leading to a blank box plot visualization.This outcome does not indicate an error in the implementation or visualization logic. Instead, it accurately reflects the nature of real-world datasets, where highly specific business rules may result in limited or no matching data.

## Dashboard

As we included Time Window the dashboard is visible only during 3PM-5PM IST.



**IMPORTANT LINKS:**

Tableau Dashboard -LINK

Wbsite-LINK

HTML-job desc\index.html

Github-Link

## 5. Skills and Competencies Developed

Technical Skills:

- Tableau Desktop: charts, filters, calculated fields, tooltips
- Data preprocessing and validation
- Handling text-based numerical data using regular expressions
- Sorting, ranking, and aggregation

Analytical Skills:

- Translating business requirements into analytical logic
- Multi-condition filtering and rule enforcement
- Pattern recognition and trend analysis
- Data interpretation and validation

## 6. Feedback and Evidence of Work

The effectiveness of the work was validated through:

- Successful execution of Tableau worksheets without errors.
- Visual confirmation of applied filters and logic.
- Interactive features such as tooltips, zoom, and drilldown behavior.
- Logical alignment between task requirements and final outputs.

Screenshots of each task, Tableau workbook files, and calculated fields serve as concrete evidence of learning and task completion.

## 7. Challenges Faced and Solutions Implemented

**Challenges**

- Experience and salary fields stored as text rather than numeric values.
- Highly restrictive filters resulting in empty visualizations.
- Time-based conditions dependent on system clock.
- Geographic drilldown implementation limitations in Tableau.

Solutions

- Used REGEXP_EXTRACT, conditional logic, and type conversion for numeric analysis.
- Retained analytical logic while relaxing visualization filters where necessary.
- Implemented time-window logic using `NOW()` and documented its dynamic nature.
- Demonstrated drilldown through interactive map behavior and tooltips.

## 8. Outcomes and Impact

The internship significantly enhanced my understanding of real-world data analytics. I gained hands-on experience in building professional-quality visualizations, applying complex logical rules, and interpreting results in a business context. The internship improved my confidence in handling analytics tools and prepared me for advanced roles in data analytics and business intelligence.The work completed during this internship demonstrates my ability to independently analyze data, apply structured logic, and present insights clearly and professionally.

# 9. Conclusion

In conclusion, this internship was a comprehensive and enriching learning experience. It strengthened my technical foundation in Tableau, enhanced my analytical thinking, and provided valuable exposure to real-world data challenges. The structured tasks, combined with detailed documentation, allowed me to develop skills that are directly applicable to industry roles. I am confident that the knowledge and experience gained through this internship will contribute positively to my academic and professional growth.