

A Project Report on

“TURISOUM DATA ANALYTICS FOR POPULAR DESTINATION”

At



“Bhagwan Mahavir College of Computer Application”,

तमसो मा ज्योतिर्गमय
Bharthana-Vesu, Surat

As A Partial Fulfilment for The Degree Of

BSc. Data Science

2023-2024

Guided By:

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Certificate

This is to certify that the summer project entitled “**Turisoum data analytics for popular destination**” has been submitted by **Mayur Patil Enrollment No. 2102020301009** at **Bhagwan Mahavir College of Computer Application** as a partial fulfilment of the requirement for the degree of **Bachelor of Science in Data Science** for the academic Year 2023-24.

Place: Surat

Date :

Asst. Prof. Sanket Trivedi

(Project Guide, BMCCA)

Dr. Jaynesh Desai

(Program Head)



Certificate

B M U

This is to certify that the summer project entitled “**Turismo data analytics for popular destination**” has been submitted by **Shyam Italiya Enrollment No. 2102020301005** at **Bhagwan Mahavir College of Computer Application** as a partial fulfilment of the requirement for the degree of **Bachelor of Science in Data Science** for the academic Year 2023-24.

Place: Surat

Date:

Asst. Prof. Sanket Trivedi

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Dr. Jaynesh Desai

(Program Head)



Date: - 10/02/2024

**PROJECT PROGRESS
REPORT**

PROJECT TITLE	Turisoum Data Analytics For Popular Destination		
PROJECT GROUP NO	2	SUPERVISOR NAME	Asst.Prof. Sanket Trivedi
PROGRAMMING LANGUAGE	Python	PROGRESS REPORT NO.	1
FRONT-END TOOLS	Power Bi	BACK-END TOOLS	Python with Jupyter Note Book
PROGRESS REPORT DURATION:	From 16/01 /2024 to 10 /02/2024		
Project Members Detail			
Sr. No.	MEMBER NAME	Sr. No.	MEMBER NAME
1.	Shyam Italiya	4.	
2.	Mayur Patil	5.	
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Task Details			
Sr. No.	MEMBER NAME	TASK COMPLETED	
1.	Mayur	Data Collecting	
2.	Shyam	Data Cleaning	
3.			
4.			
5.			
6.			
Comment By Supervisor			
Next Progress Report Date: 11/03/2024			

Is Progress of Project Approved? ☐Project Supervisor:
Name & Sign



Date: - 11/03/2024

PROJECT PROGRESS REPORT

PROJECT TITLE	Turisoum Data Analytics For Popular Destination		
PROJECT GROUP NO	2	SUPERVISOR NAME	Asst.Prof.Sanket Trivedi
PROGRAMMING LANGUAGE	Python	PROGRESS REPORT NO.	2
FRONT-END TOOLS	Power Bi	BACK-END TOOLS	Python with Jupyter Note Book
PROGRESS REPORT DURATION:	From 11/02/2024 to 10/03/2024		
Project Members Detail			
Sr. No.	MEMBER NAME	Sr. No.	MEMBER NAME
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2.	Mayur Patil	5.	
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Task Details			
Sr. No.	MEMBER NAME	TASK COMPLETED	
1.	Shyam	Data Processing	
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3.	Mayur	Data Analysis	
4.	Mayur	System planning & Design	
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Comment By Supervisor			
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PROJECT
PROGRESS
REPORT

PROJECT TITLE	Turisoum Data Analytics For Popular Destination		
PROJECT GROUP NO	2	SUPERVISOR NAME	Asst.Prof.Sanket Trivedi
PROGRAMMING LANGUAGE	Python	PROGRESS REPORT NO.	3
FRONT-END TOOLS	Power Bi	BACK-END TOOLS	Python with Jupyter Note Book
PROGRESS REPORT DURATION:	From 11/03/2024 to 10/04/2024		
Project Members Detail			
Sr. No.	MEMBER NAME	Sr. No.	MEMBER NAME
1.	Shyam Italiya	4.	
2.	Mayur Patil	5.	
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Task Details			
Sr. No.	MEMBER NAME	TASK COMPLETED	
1.	Shyam	System testing	
2.	Mayur	System testing	
3.	Shyam	Create PPT	
4.	Mayur	Create Documentation	
5.			
6.			
Comment By Supervisor			
Next Progress Report Date: / /2024			

Is Progress of Project Approved? ☐

Project Supervisor:
Name & Sign

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Introduction

1.1 Collage Profile

Bhagwan Mahavir College of Computer Application, Surat a highly commendable private institute, occupies a place amongst the technical institutes of the southern region of Gujarat. It is established in year 2008, financed and run by the Bhagwan Mahavir College Foundation, Surat. It is affiliated to Bhagwan Mahavir University.

The college is controlled by the executive board formed from the representatives of the Trust under constitution & by laws of the college. The college campus is located at the open green field areas with a beautiful location, situated at New city light Road, Bharthana – Vesu, Surat.

The College has excelled itself in many fields. It has occupied a prominent place in the education sphere of South Gujarat. The building surrounded by green fields and contains spacious classrooms, well documented library, a multipurpose hall, modern computer lab. It has at present around 850 students.

Vision

Bhagwan Mahavir College of Computer Application aims to become diversified, market leaders and preferred institution within the country as well as global repute for the holistic development of community in the domain of Information Technology/Computer Science.

Mission

Major focus on holistic development of student's career

1. To become the diversified and multidisciplinary institution in the domain of Computer Application/Science
2. To Develop the life-long community
3. To keep curriculum, Teaching & Learning pedagogy dynamic, agile, innovative and industry responsive
4. To focus more on Outcome based learning, industry collaboration and encouragement for entrepreneurship, innovation and start-ups

Objectives

The College of Computer Application shares University's overall mission of being a center of academic excellence by providing qualitative education and integrating training. The progressive and innovative faculty, through their teaching, scholarship and publication, leadership and service are fully committed to the provision of an educational environment which prepares individuals to become successful professionals.

The main objective of the Department is to help students meet their long-range needs as maturing professionals as well as their immediate needs upon entering the profession.

1.2 Project Profile

Project Title	Turismo Data Analytics For Popular Destination
Project Definition :	Analysis of India's Tourism Sector Using Python Data Analysis
Internal Guide	Asst. Prof. Sanket Trivedi
Front End	Python, Jupyter Notebook, Matplotlib and Seaborn, Pandas, NumPy
Back End	Dataset, Data Cleaning & Preprocessing, Statistical Analysis
Language	Python
Duration	3 Months
Operating System	Windows 11
Submitted By :	Mayur Patil Shyam Patil



2.1 Scope

1. **Economic Impact Analysis:** The report will analyze the contribution of India's tourism sector to its GDP and overall economic growth. It will delve into the revenue generated by tourism-related activities and its significance in the national economy.
2. **Employment Trends:** The report will explore the job market dynamics within India's tourism sector, including the number of direct and indirect employment opportunities created by tourism activities.
3. **Tourist Destination Analysis:** It will examine the popularity and appeal of various tourist destinations across India, categorizing them into wildlife expeditions, natural wonders, historical landmarks, and spiritual retreats.
4. **Insights from Data Analysis:** Utilizing Python data analysis techniques, the report will extract meaningful insights from the comprehensive dataset to provide a deeper understanding of India's tourism sector.

2.2 Advantages:

1. **Comprehensive Analysis:** By leveraging a comprehensive dataset and employing advanced data analysis techniques, the report offers a thorough examination of various dimensions of India's tourism sector.
2. **Evidence-Based Insights:** The findings presented in the report are derived from rigorous data analysis, providing policymakers, businesses, and stakeholders with reliable information to make informed decisions.
3. **Economic Significance Highlighted:** Emphasizing the substantial role of tourism in India's GDP and employment, the report underscores the economic significance of the tourism sector, aiding in policy formulation and strategic planning.
4. **Identification of Growth Opportunities:** The report identifies emerging trends and opportunities within India's tourism industry, enabling stakeholders to craft strategies aimed at further enriching and expanding the sector.
5. **Valuable Resource for Stakeholders:** By furnishing valuable insights, the report serves as a valuable resource for policymakers, businesses, and stakeholders involved in the development and promotion of India's tourism industry.

3. System planning & Design

3.1 Requirement Analysis & Data Gathering

Table of Contents:

- Methodology
- Key Findings
- Conclusion

Methodology:

To conduct this data analysis, a systematic approach was followed to ensure accuracy and reliability in the findings. The methodology encompassed the following steps:

- 1. Data collecting :** These data sets cover a wide range of aspects including foreign tourist arrivals, age distribution of tourists, quarterly distribution, international tourism comparisons, specific factors influencing international tourist visits, domestic and foreign tourist visits to monuments, contribution to the share market, and domestic and foreign tourist visits per state.

Here's a breakdown of the datasets you mentioned:

Foreign Tourist Arrivals in India (2001-2020): This dataset likely contains the total number of foreign tourists arriving in India each year from 2001 to 2020.

FTA Distribution in India by Age (2001-2019): This dataset probably provides the percentage distribution of foreign tourists in India based on different age groups from 2001 to 2019.

Quarterly Distribution of Foreign Tourists (2001-2019): This dataset likely presents the quarterly distribution of foreign tourists visiting India from 2001 to 2019.

World Tourism Comparisons with India (2001-2021): This dataset probably compares world tourism trends with those of India, possibly including rankings and other relevant statistics from 2001 to 2021.

International Tourist Arrivals (ITAs) in India (2019): This dataset may include the percentage distribution of international tourist visits to India by specific factors (grouped by countries or regions) in 2019.

Domestic and Foreign Tourists to Popular Monuments (2019-2021): This dataset likely provides statistics on the number of domestic and foreign tourists visiting popular monuments in India during 2019, 2020, and 2021, along with their respective regions.

Contribution to Share Market of Indian Tourism (2017-2019): This dataset probably includes statistics on the percentage contribution of Indian tourism to the share market from 2017 to 2019.

Domestic and Foreign Tourists per State (2019-2020): This dataset may offer detailed statistics on domestic and foreign tourist visits to each state in India for the years 2019 and 2020.

- 2. Data Pre-processing:** you've performed several essential pre-processing steps to ensure the quality and consistency of your collected data.

Removing Duplicates: This step involves identifying and removing any duplicate rows from your datasets. Duplicate rows can skew analysis results and lead to inaccurate insights.

Handling Missing Values: Missing values are common in datasets and need to be addressed appropriately. Depending on the nature of the missing data, techniques such as imputation (replacing missing values with estimated ones), deletion of rows or columns with missing values, or using advanced methods like interpolation

can be applied.

Reshaping the Data: Reshaping the data involves restructuring it to fit the desired format for analysis. This may include pivoting, melting, or stacking data to transform it from wide to long format or vice versa, depending on the analytical requirements.

Renaming the Index and Dropping Columns: Renaming the index involves assigning meaningful labels to the rows or observations in your dataset. Dropping unnecessary columns eliminates redundant or irrelevant information that does not contribute to the analysis.

Combining Data: Combining data involves merging or joining multiple datasets together to enrich the analytical scope or provide additional context. This can be achieved through common identifiers or keys shared between datasets.

Parsing the DataFrame: Parsing the DataFrame involves converting string data into appropriate data types (e.g., dates, numerical values) for analysis. This ensures that the data is interpreted correctly during analysis and prevents errors stemming from incorrect data types.

Statistical & Exploratory Data Analysis (EDA): Statistical analysis and exploratory data analysis (EDA) are crucial steps in deriving insights and understanding the underlying patterns and relationships within your data. Here's how these processes might have been conducted:

Descriptive Statistics: Descriptive statistics provide a summary of the main characteristics of the dataset. This includes measures of central tendency such as mean, median, and mode, as well as measures of dispersion such as standard deviation, variance, and range. Descriptive statistics help in understanding the distribution and variability of the data.

Visualization Techniques: Visualizations such as histograms, box plots, scatter plots, and bar charts are used to visually represent the data. These plots help in identifying patterns, outliers, and trends within the dataset. For example, a histogram can show the distribution of foreign tourist arrivals over the years, while a box plot can reveal the variability in age distribution among tourists.

Correlation Analysis: Correlation analysis is performed to understand the relationship between different variables in the dataset. This involves calculating correlation coefficients such as Pearson's correlation coefficient to measure the strength and direction of the relationship between two variables. For instance, you might analyze the correlation between the number of foreign tourists and the contribution to the share market of Indian tourism.

Regression Analysis: Regression analysis may be conducted to model the relationship between dependent and independent variables in the dataset. This helps in predicting future trends or understanding the impact of one variable on another. For example, you might use regression analysis to predict the number of foreign tourists based on factors such as economic indicators or marketing efforts.

Cluster Analysis: Cluster analysis can be employed to identify groups or clusters within the data based on similarities or differences between observations. This helps in segmenting the data and understanding the characteristics of different groups. For instance, you might use cluster analysis to group states in India based on the number of domestic and foreign tourists visiting each state.

Reporting: Creating a comprehensive data analysis report involves effectively communicating the findings, insights, and recommendations derived from the analysis process. Here's how such a report might be structured:

Executive Summary: Provide a brief overview of the report, including the objectives, methodology, key findings, and recommendations.

Introduction: Introduce the topic of analysis, its significance, and the scope of the report. Outline the objectives and purpose of the analysis.

Data Overview: Briefly describe the datasets used in the analysis, including their sources, time periods covered, and key variables.

Methodology: Explain the analytical methods and techniques employed in the analysis, such as descriptive statistics, visualization techniques, correlation analysis, regression analysis, etc.

Findings and Insights: Present the main findings and insights derived from the analysis. Use visualizations, tables, and concise explanations to highlight key trends, patterns, relationships, and outliers identified in the data.

Key Metrics and Performance Indicators: Highlight the key metrics and performance indicators used to assess the tourism industry's performance, such as foreign tourist arrivals, age distribution, quarterly trends, market share, etc.

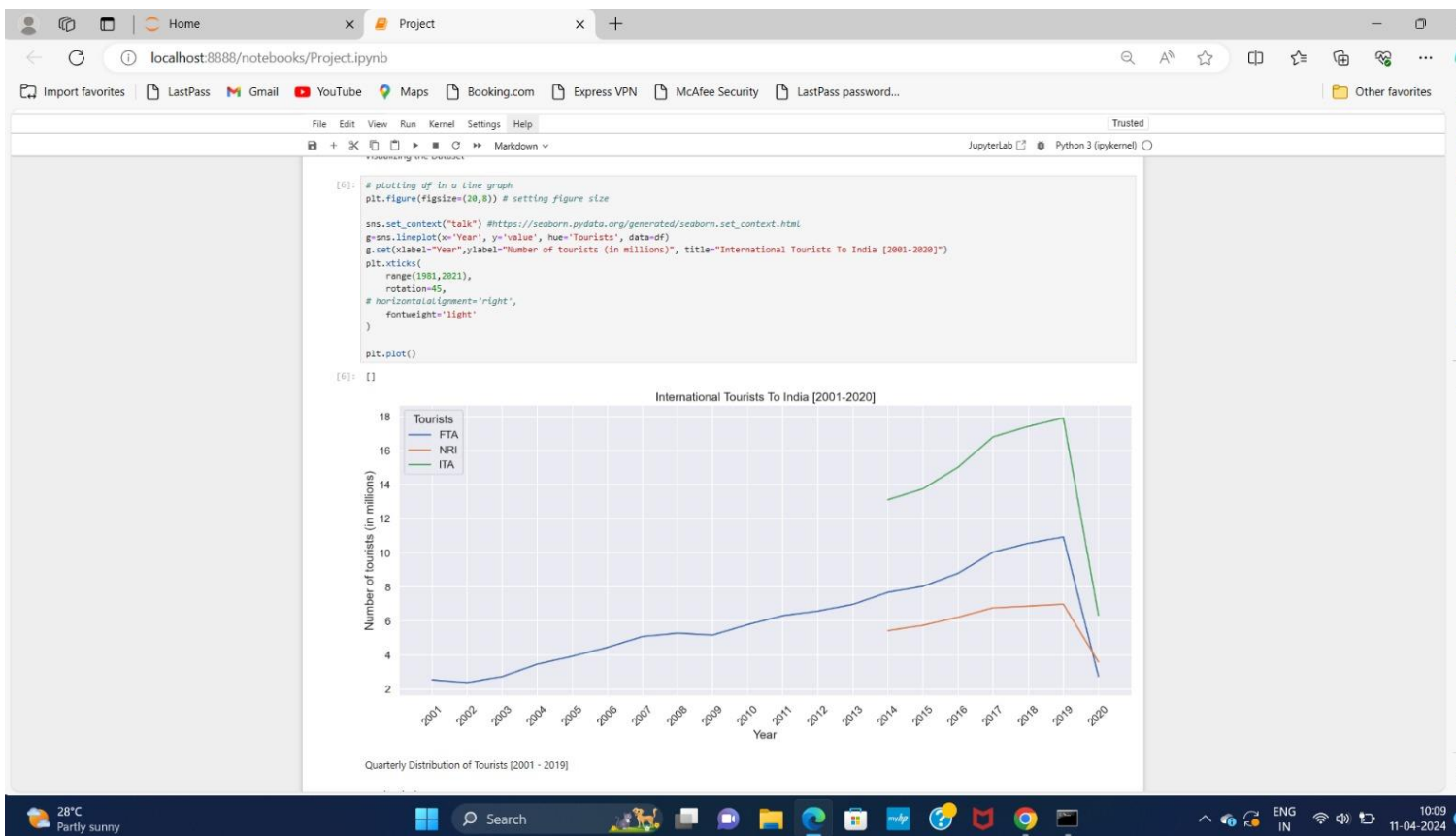
Recommendations: Based on the analysis findings, provide actionable recommendations for stakeholders, policymakers, or businesses to improve the performance of the tourism sector. These recommendations should be supported by evidence from the analysis.

Conclusion: Summarize the main findings and recommendations of the analysis. Emphasize the importance of the insights gained and the potential impact of implementing the recommendations.

References: Include a list of references or data sources cited in the report.

Appendices: Optionally, include additional detailed tables, charts, or supplementary information that supports the main analysis findings.

A. Statistics of International Tourists to India [2001 - 2020]-



It seems you've outlined some key points regarding the growth trajectory of India's tourism sector, the impact of the COVID-19 pandemic, factors influencing growth, negative growth years, and the challenges faced in recovery. Here's a summary:

Pre-2020 Growth: Before 2020, India's tourism sector experienced steady growth, showcasing its potential as an economic driver. This growth trajectory indicated a positive trend, with increasing numbers of tourists visiting the country over the years.

Impact of COVID-19: The COVID-19 pandemic had a significant and detrimental impact on the tourism sector worldwide, including in India. Travel restrictions, lockdowns, and safety concerns led to a sharp decline in tourist arrivals, causing a major setback to the sector and the economy as a whole.

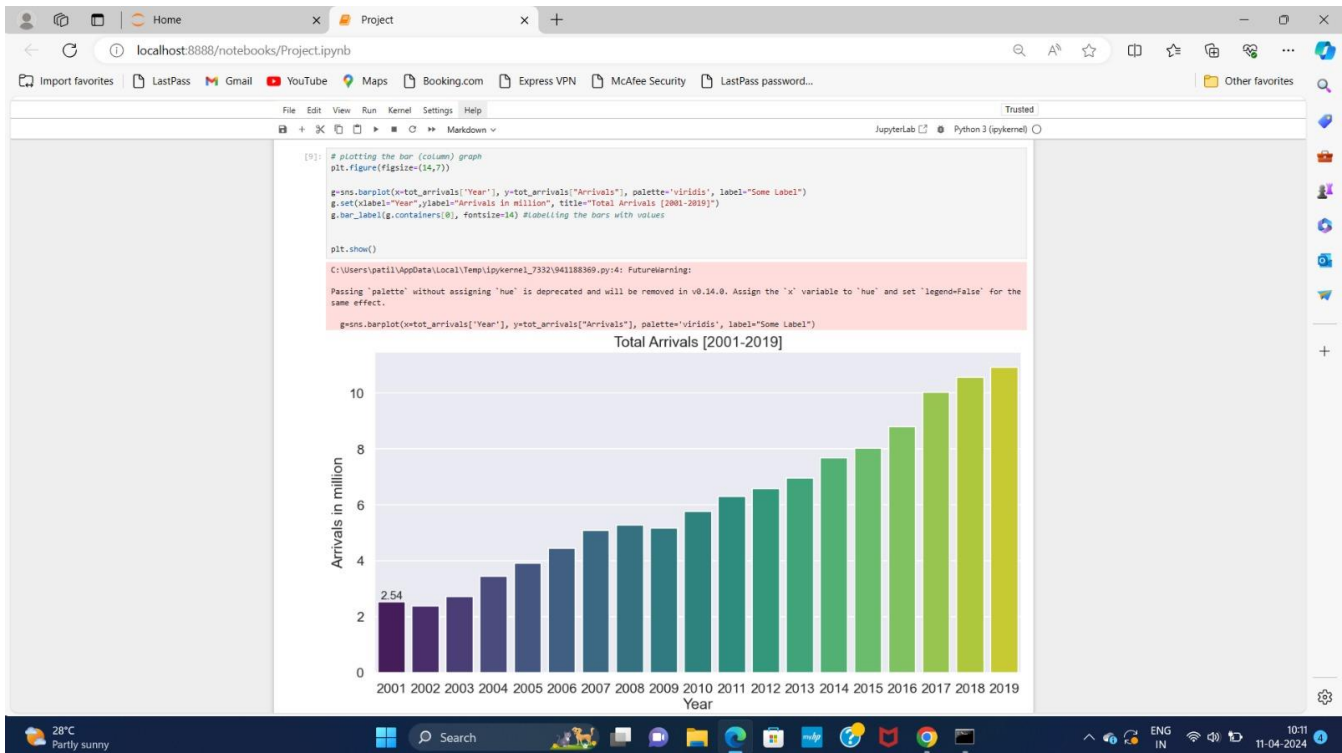
Factors Influencing Growth: The growth in Foreign Tourist Arrivals (FTAs) in India has been influenced by various factors over the years. Periods of double-digit positive growth, such as 2003 to 2007, 2010, 2014, and 2017, indicated strong performance and the attractiveness of India as a tourist destination.

Negative Growth Years: There were also years with negative growth in FTAs, such as 2001 & 2002 (due to events like the 9/11 attacks in the US), and 2009 (due to the 26/11 attacks in Mumbai). These incidents, along with other factors, impacted tourist sentiment and led to a decline in arrivals during those periods.

Recovery Challenges: Recovering from the economic slump caused by the pandemic poses challenges for the tourism sector. Rebuilding consumer confidence, implementing safety measures, and adapting to changing travel preferences are crucial for its recovery.

These insights provide a holistic understanding of the growth trajectory of India's tourism sector, the setbacks faced due to external events like terrorist attacks, and the challenges in recovering from the impact of the COVID-19 pandemic. Addressing these challenges will be essential for the sector's revival and sustained growth in the future.

1. Total Arrivals [2001-2019]:

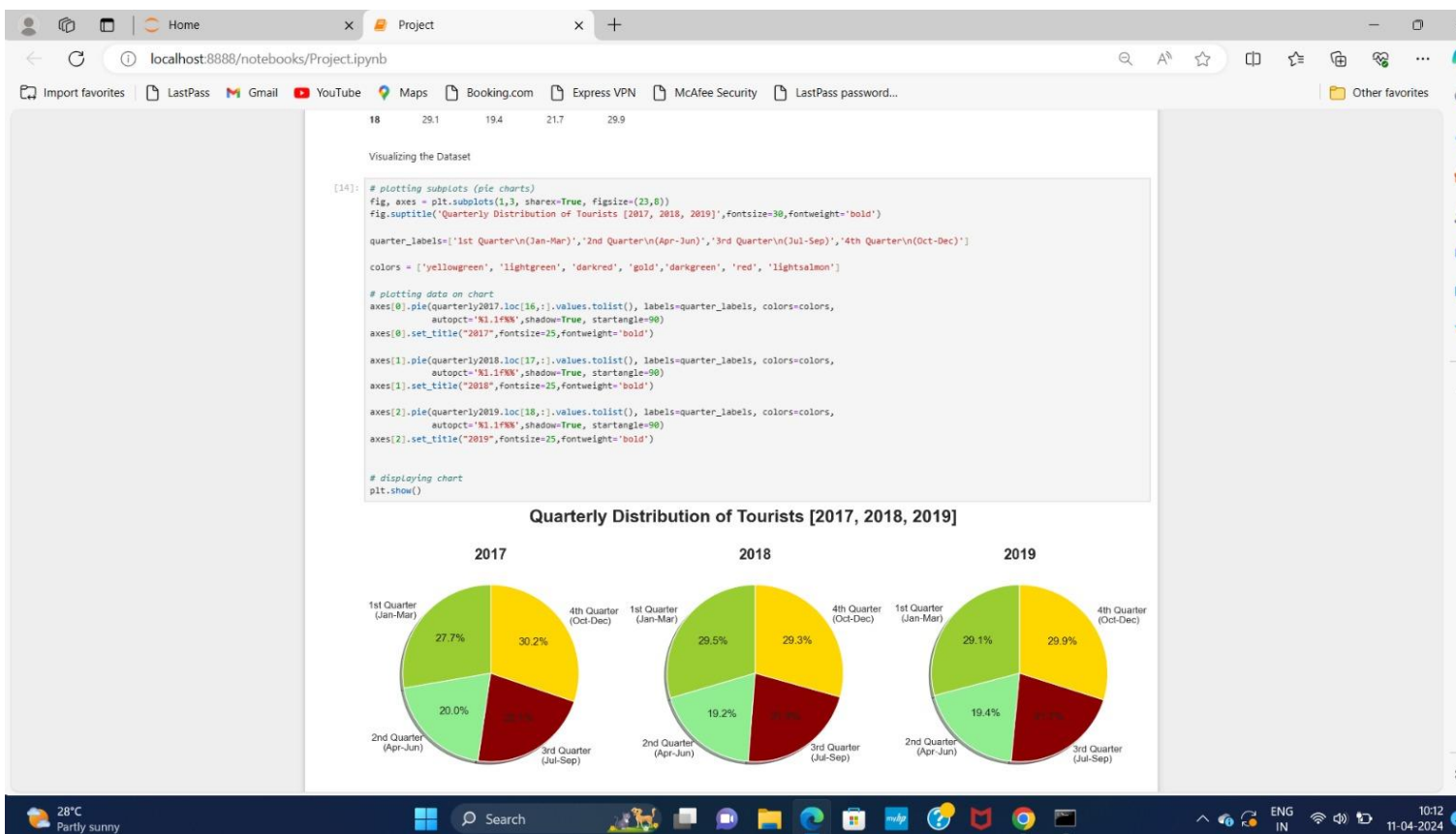


The column plot likely illustrates the overall positive trend in India's tourism sector, despite encountering setbacks in certain years. This observation underscores the resilience and long-term growth potential of the tourism industry in India. Despite facing challenges such as negative growth in specific years due to external events like terrorist attacks, the sector has generally shown improvement over time.

The upward trajectory in tourist arrivals indicates the attractiveness of India as a destination and the effectiveness of various strategies implemented to promote tourism. It also reflects the diverse cultural, historical, and natural attractions that draw visitors from around the world.

While acknowledging the exceptions and challenges faced along the way, it's essential to recognize the overall positive trend and the opportunities for continued growth and development in India's tourism sector. By leveraging strengths, addressing weaknesses, and adapting to changing circumstances, the industry can sustain its upward momentum and contribute significantly to the country's economy and development.

2. Quarterly Distribution of FTAs during 2017, 2018 and 2019:



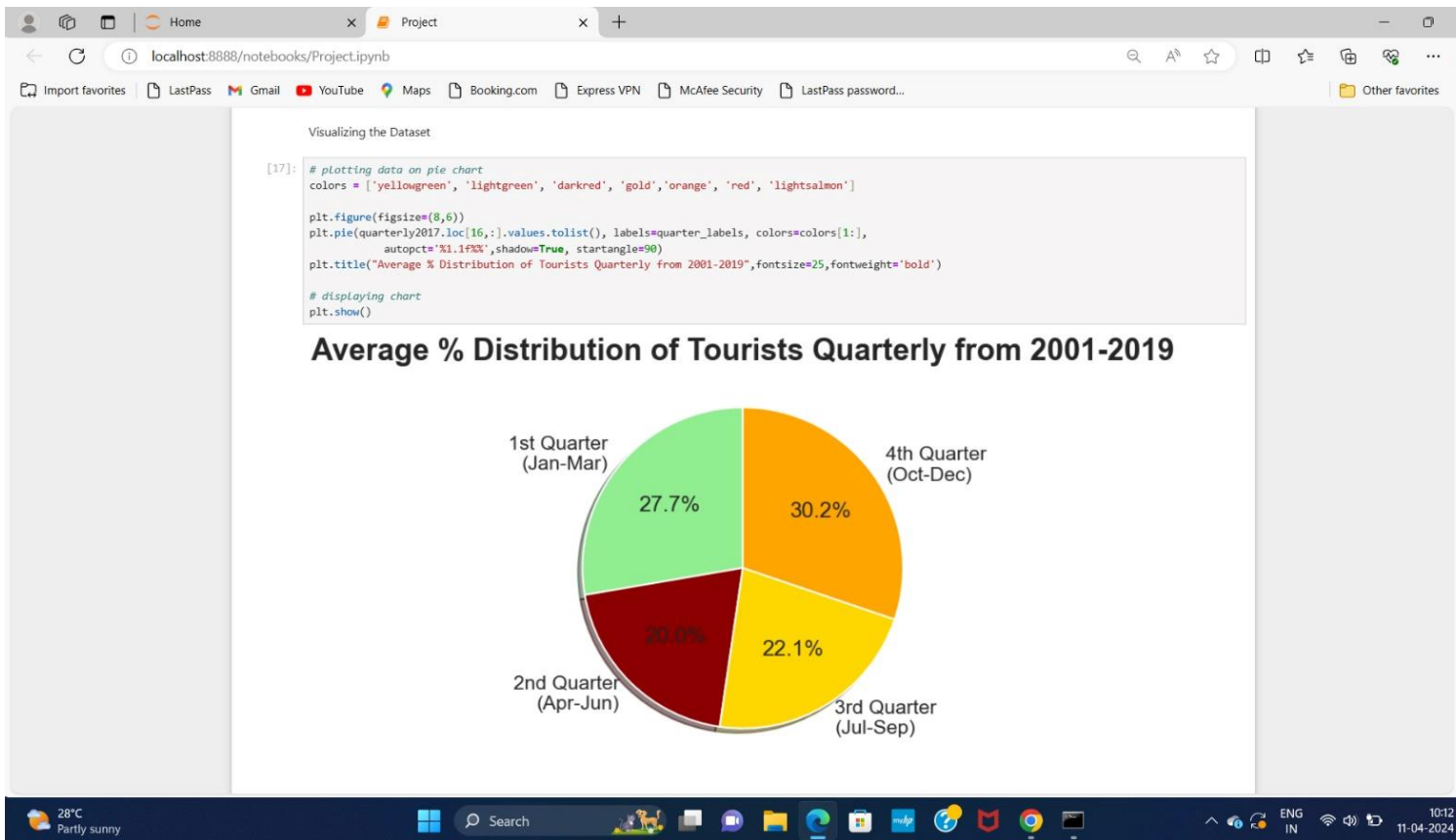
The observation from the pie charts indicates a seasonal trend in foreign tourist arrivals (FTAs) in India during the years 2017, 2018, and 2019. Here's a summary of the findings:

Highest FTAs During Winter Seasons (4th and 1st Quarters): The number of FTAs in India peaked during the winter seasons, specifically in the 4th Quarter (Oct-Dec) and the 1st Quarter (Jan-Mar). These periods are typically considered the best seasons to visit India due to favorable weather conditions and comfortable temperatures. The influx of tourists during these months suggests that visitors are drawn to India's attractions and cultural experiences during the pleasant winter weather.

Lowest FTAs During Summer Season (2nd Quarter): Conversely, the number of FTAs was lowest during the summer season, particularly in the 2nd Quarter (Apr-Jun). The heat and high temperatures during these months likely deterred tourists from visiting India, leading to a decrease in arrivals. Summer in India can be characterized by intense heat, humidity, and monsoon rains in certain regions, making it less appealing for travel compared to the more temperate winter months.

Understanding these seasonal patterns in foreign tourist arrivals can help tourism authorities, businesses, and stakeholders in India plan and strategize their marketing efforts, promotions, and tourism initiatives. By focusing on promoting India's attractions and experiences during the peak winter seasons and mitigating the impact of the summer heat through targeted campaigns or alternative offerings, the tourism industry can optimize visitor numbers and enhance the overall tourist experience throughout the year.

3. Average Percentage Distribution of FTAs Quarterly [2001 - 2019]:



The observation from the pie chart provides valuable insight into the seasonal trends of foreign tourist arrivals (FTAs) in India over the period from 2001 to 2019. Here's a summary of the findings:

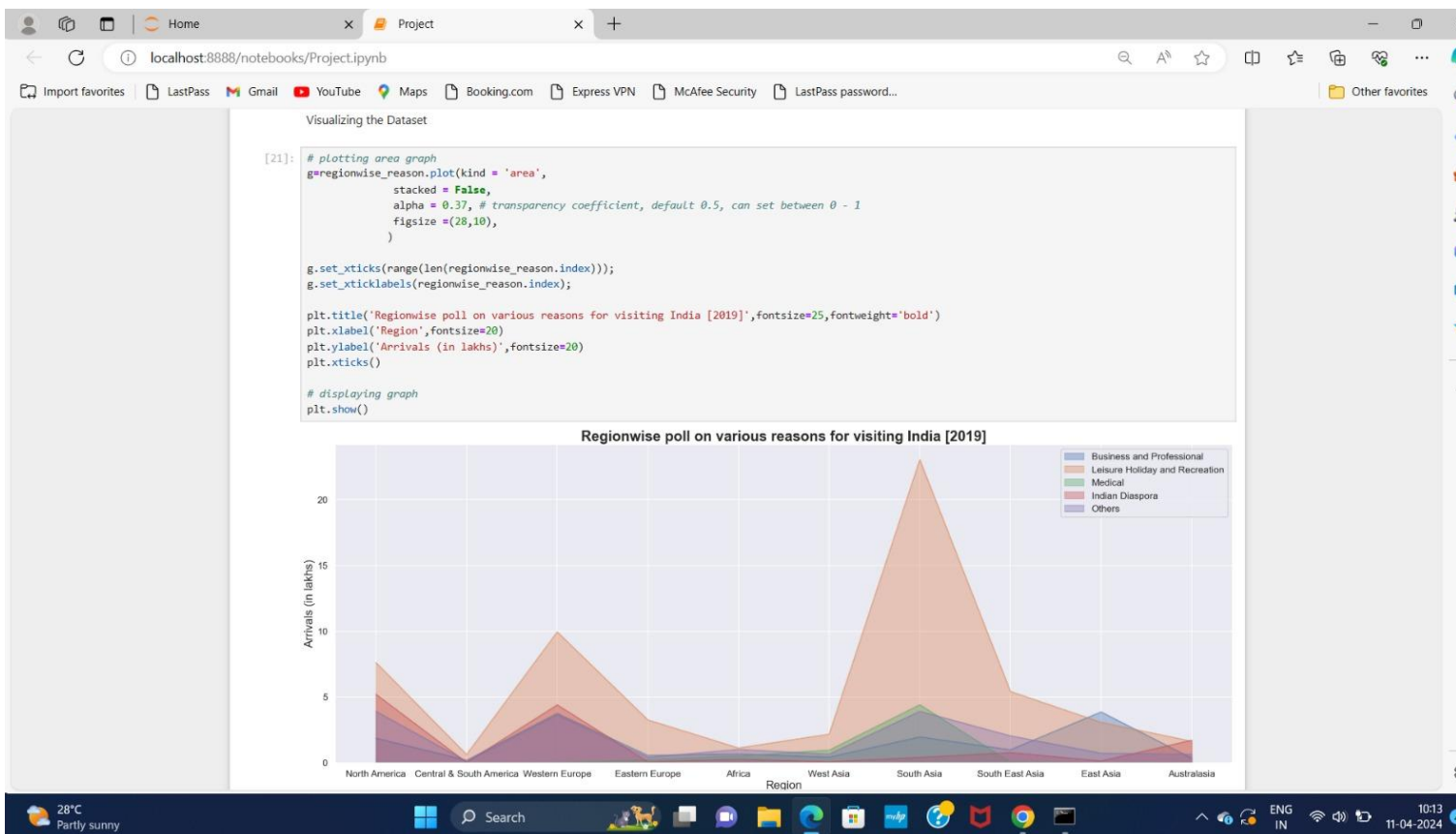
Highest FTAs During Winter Season: On average, the number of FTAs in India was highest during the winter season. This aligns with the general perception that the winter months, particularly the 4th Quarter (Oct-Dec) and the 1st Quarter (Jan-Mar), are the peak tourist seasons in India. The favorable weather conditions, cooler temperatures, and festive celebrations during this time likely attract more tourists to the country.

Lowest FTAs During Summer Season: Conversely, the number of FTAs was lowest during the summer season, which typically includes the 2nd Quarter (Apr-Jun). The heat and humidity prevalent during the summer months, along with the onset of the monsoon season in certain regions, may deter tourists from visiting India during this time. The discomfort associated with the hot weather and potential travel disruptions due to heavy rains likely contribute to the decline in tourist arrivals during the summer season.

Understanding these seasonal variations in foreign tourist arrivals is crucial for stakeholders in the tourism industry to plan and optimize their marketing strategies, promotions, and infrastructure investments. By capitalizing on the peak winter season and implementing targeted initiatives to attract visitors during the offseason, India can maximize its tourism potential and enhance the overall tourist experience throughout the year.

B. Statistics of ITAs to India based on purpose 2019-

1. Statistics of ITAs to India based on purpose 2019 [Region Wise]:



The insights provided from the area plot highlight the significant contribution of South Asia, particularly from countries like Bangladesh, to the number of tourist visits in India. Among the reasons for visiting India from these regions, leisure holidays and recreation appear to be the most prevalent, while medical purposes are comparatively less common.

Despite being less common among the specified reasons, medical tourism in India has thrived exceptionally well. Here are some key factors contributing to India's success as a medical tourism destination:

Cost-effectiveness: India offers medical treatments at significantly lower costs compared to many other countries. This cost-effectiveness makes it an attractive option for medical tourists seeking quality healthcare at affordable prices.

Quality Healthcare Infrastructure: India boasts a robust healthcare infrastructure with modern facilities and state-of-the-art medical equipment. The country is home to highly skilled doctors and medical professionals who provide world-class medical services.

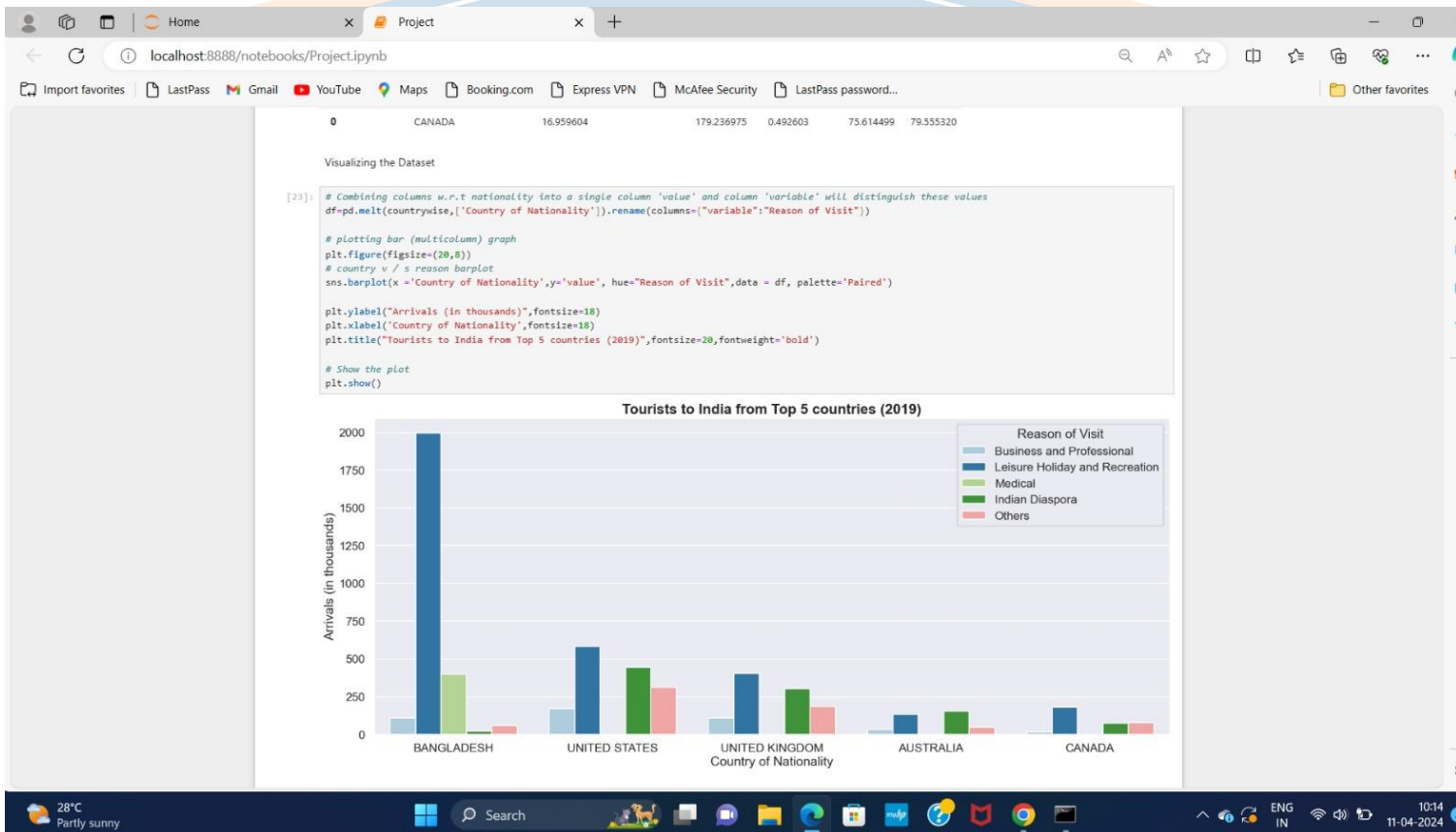
Diverse Range of Therapies: During the recovery period, patients have access to a diverse range of therapies such as Ayurveda, Naturopathy, and Yoga. These traditional and alternative therapies complement conventional medical treatments and enhance the overall healing process for patients.

English-speaking Doctors: The presence of English-speaking doctors in India helps bridge the language barrier for foreign tourists. This makes it easier for international patients to communicate with healthcare providers

and receive the necessary medical care without facing language challenges.

These factors collectively contribute to India's position as one of the top destinations for medical tourism in Asia. The country's affordability, high-quality healthcare services, diverse treatment options, and language accessibility make it a preferred choice for patients seeking medical treatment abroad.

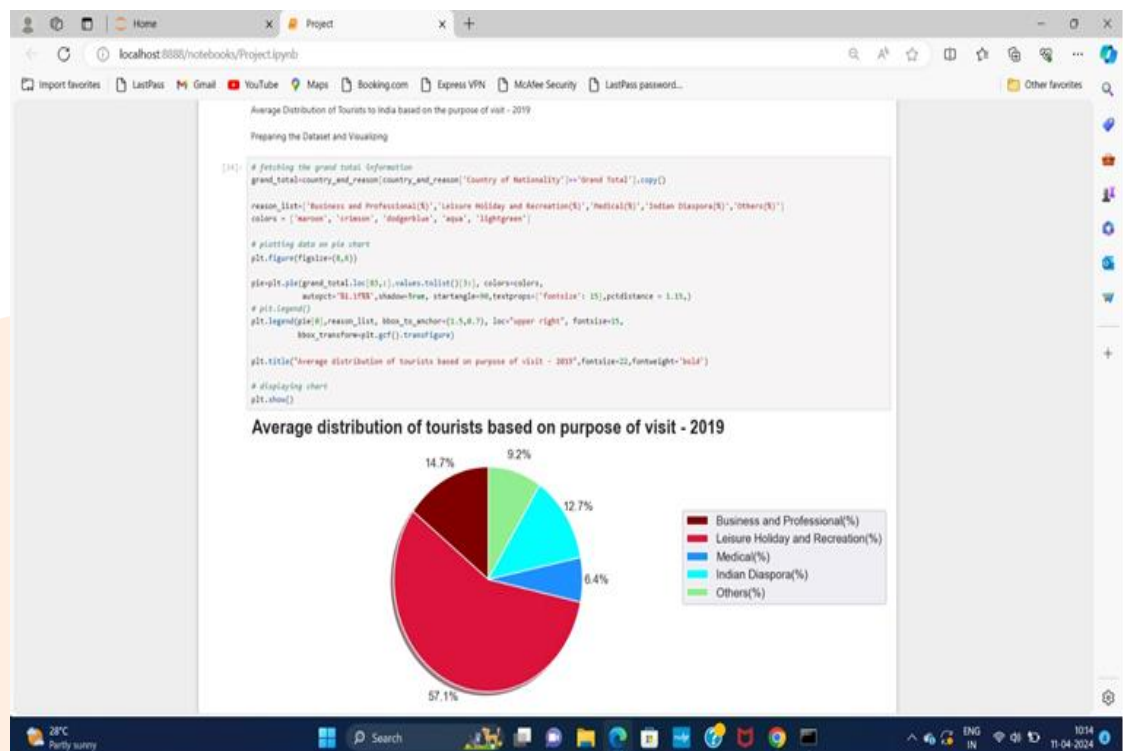
2. Tourists to India from Top 5 countries - 2019:



The multibar graph effectively underscores Bangladesh's prominence as the leading contributor to India's tourism sector. The significant portion of visitors from Bangladesh citing leisure as their primary reason for visiting India aligns with this observation. The statistic from the 'India Tourism Statistics at a Glance 2021' report, indicating that Bangladesh accounted for 23.6 percent of the total foreign tourist visits to India, further solidifies Bangladesh's longstanding position as the primary source of international tourists to India.

This trend underscores the strong cultural, economic, and historical ties between India and Bangladesh, which continue to facilitate tourism exchanges between the two countries. Factors such as geographical proximity, shared heritage, and ease of travel contribute to the flow of tourists from Bangladesh to India. Understanding and leveraging this relationship can help Indian tourism authorities develop targeted marketing strategies, tailor tourism offerings, and strengthen bilateral tourism cooperation initiatives to further enhance the tourism sector's growth and sustainability.

3. Average Distribution of Tourists to India based on the purpose of visit - 2019:



Indeed, the inference drawn from the pie chart aligns with the diverse attractions and experiences that India offers to tourists. With its rich cultural heritage, breathtaking natural landscapes, architectural marvels, spiritual destinations, and tranquil retreats, India has something to offer to every traveler's taste and preference.

Natural Wonders: From the serene backwaters of Kerala to the majestic Himalayan peaks in the north, India is blessed with a wide array of natural wonders that attract nature lovers and adventure enthusiasts alike.

Tranquil Places: Whether it's the peaceful beaches of Goa, the tranquil hill stations of Himachal Pradesh, or the serene tea gardens of Darjeeling, India offers numerous destinations where travelers can unwind and rejuvenate amidst nature's beauty.

History and Architecture: India's rich history spanning thousands of years is reflected in its architectural wonders, including ancient temples, forts, palaces, and heritage sites such as the Taj Mahal, Qutub Minar, and Hampi ruins, which draw history buffs and culture enthusiasts from around the world.

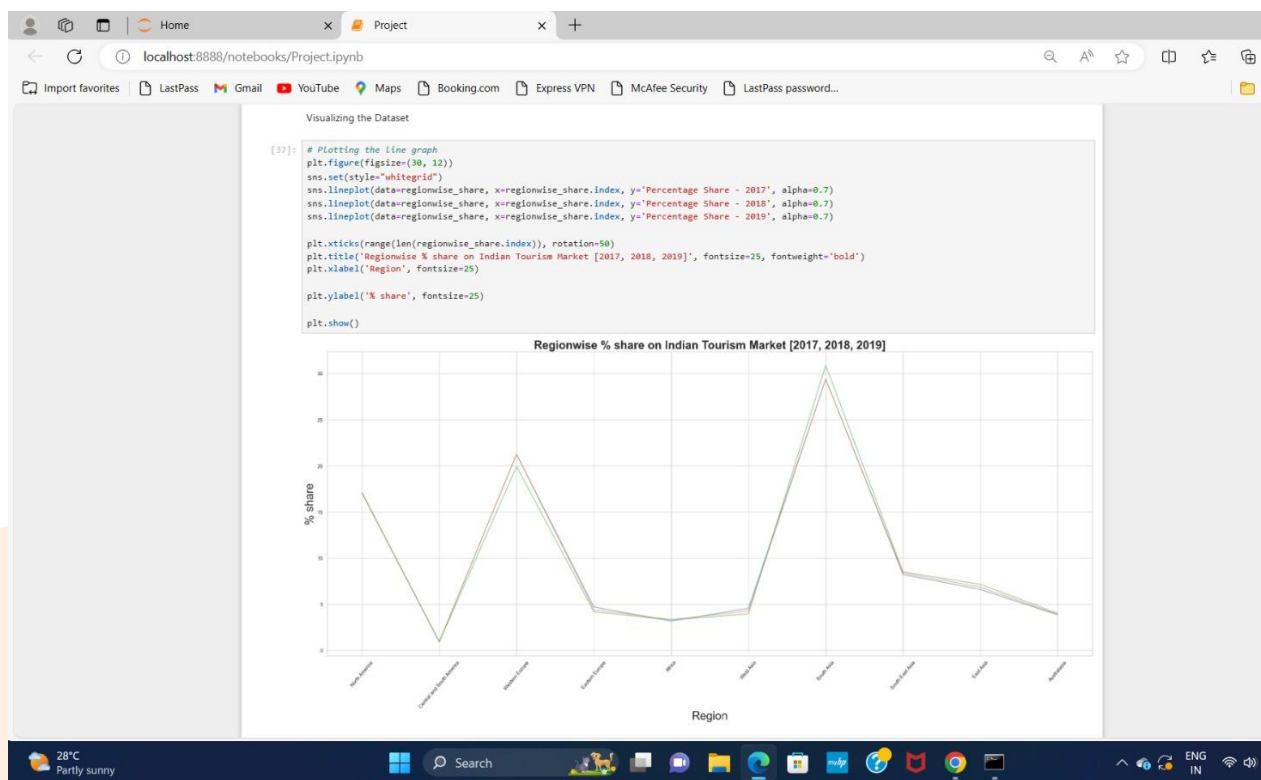
Spirituality: India is also known as the land of spirituality, with sacred pilgrimage sites, ashrams, and meditation centers attracting seekers and spiritual travelers seeking inner peace and enlightenment.

The diverse offerings and experiences available in different states of India make it a perfect destination for leisure travelers seeking a memorable and enriching trip. By promoting its unique attractions and catering to the varied interests of tourists, India can continue to attract visitors from around the globe and establish itself as a premier leisure tourism destination.

Thus from the above pie chart, it can be inferred that most tourists visit India primarily for leisure. Each state in India is famous for different tourist attractions. Different places in India will entertain tourists with natural wonders, tranquil places, history and architecture, spirituality etc. All these aspire visitors to visit India for a memorable trip and is the perfect destination for leisure.

1. Contribution to the Share Market of Indian Tourism region wise [2017 - 2019]





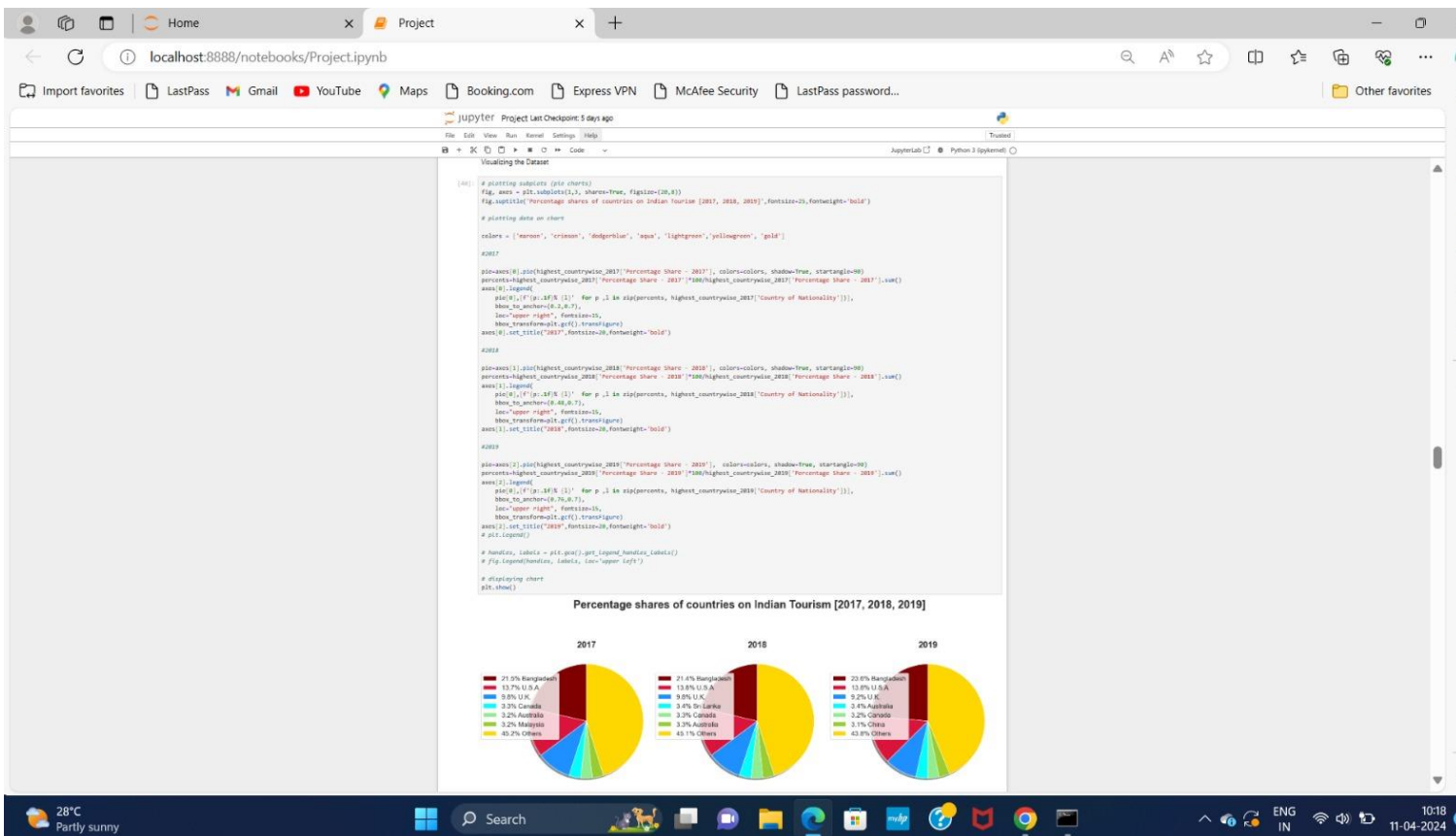
The insights derived from the multi-line graph highlight the significant contributions of key regions, such as South Asia (predominantly from Bangladesh), Western Europe (primarily from the UK), and North America (including the USA and Canada), to India's tourism share market. These regions play a crucial role in driving tourist arrivals and expenditure within the Indian tourism sector.

Moreover, the inclusion of figures related to Non-Resident Indians (NRIs) in the definition of International Tourist Arrivals since 2014 has had a notable impact on India's tourism statistics and representation in the market. By incorporating NRIs into the tourism data, India has enhanced its overall statistics, leading to a more comprehensive understanding of the tourism market's dynamics and performance.

This change reflects the recognition of the significant contributions made by NRIs to India's tourism sector, both in terms of visits to their home country for personal reasons and their role in promoting tourism through visits, investments, and cultural exchanges. By acknowledging and including NRIs in the tourism statistics, India demonstrates a commitment to accurately representing the diversity and complexity of its tourism market.

Overall, the inclusion of NRIs has positively influenced the representation of India's tourism market, providing stakeholders with valuable insights into the sector's growth, trends, and potential areas for development. This enhanced understanding can inform strategic decision-making, policy formulation, and targeted marketing efforts aimed at further promoting India as a premier tourism destination.

2. Contribution to the Indian Tourism Share Market country wise [2017 - 2019]:



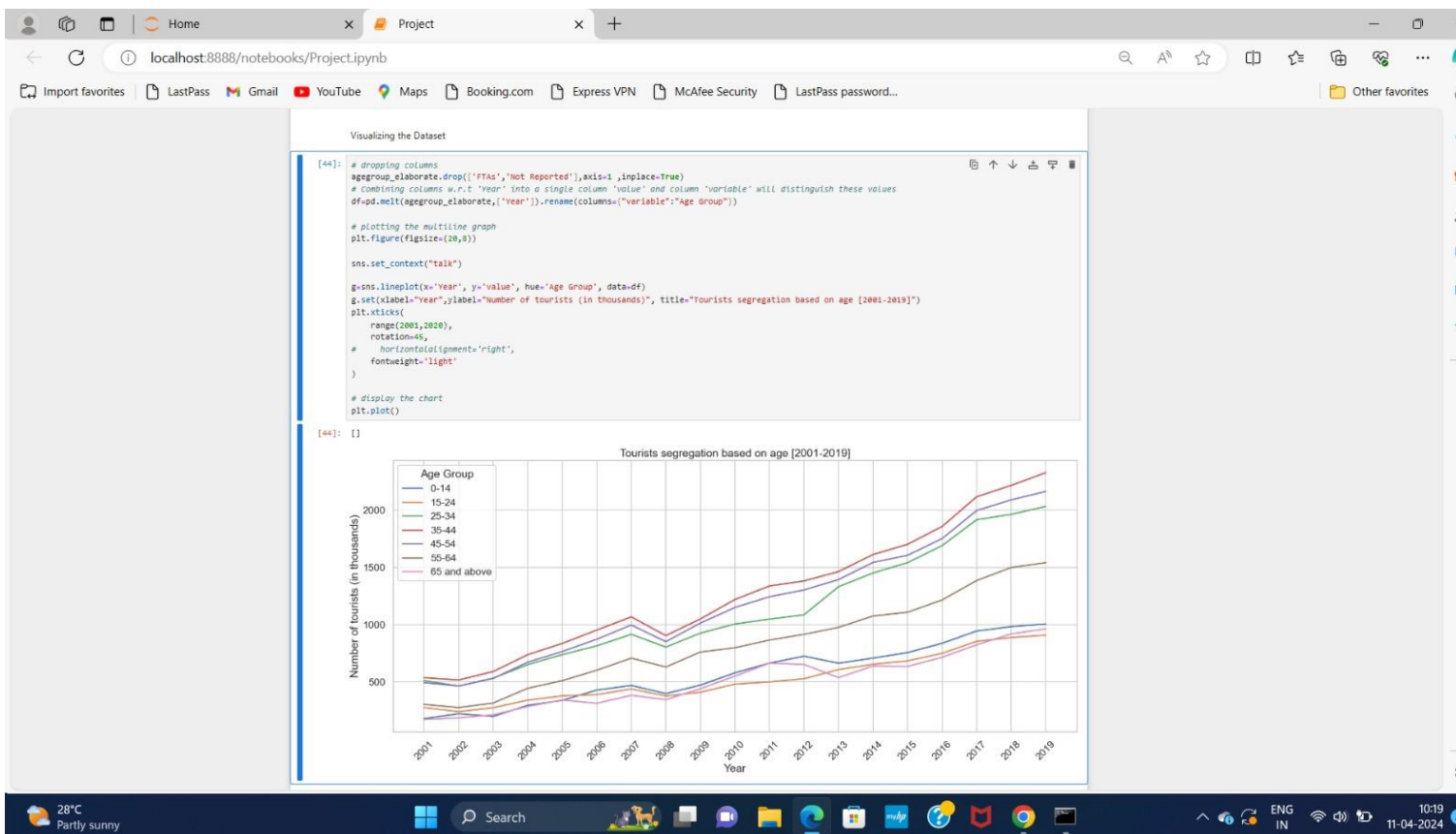
The inference drawn from the pie charts regarding the contributions to the Indian share market by major countries during the years 2017, 2018, and 2019 suggests stability and consistency in the leading contributors. Specifically, Bangladesh, USA, and UK appear to maintain their positions as the top contributors to India's tourism share market during this period.

This stability in contributions from these major countries indicates a consistent flow of tourists and investment from these key markets, reflecting sustained interest and engagement with India's tourism sector. It also suggests that the marketing efforts, partnerships, and policies targeting these countries may have been effective in maintaining their support and participation in India's tourism market.

Understanding the consistent contributions from these major countries allows stakeholders in the tourism industry to tailor their strategies and initiatives to further strengthen relationships, enhance visitor experiences, and capitalize on emerging opportunities for collaboration and growth. By nurturing these key partnerships and sustaining engagement with top-contributing markets, India can continue to drive growth and innovation in its tourism sector.

E. Tourist segregation based on age [2001 - 2019]-

1. FTAs segregated based on age [2001 - 2019]:



The insights derived from the multi-line plot provide valuable information about the age distribution of foreign tourist arrivals (FTAs) in India from 2001 to 2019. Here's a summary of the key findings:

Age Distribution: The majority of tourists visiting India during this period fell within the age range of late 20s to early 50s. This age group accounted for the highest proportion of FTAs, indicating that individuals in this demographic are more likely to travel to India.

Consistency Over Time: There hasn't been significant variation in the proportion of FTAs across different age groups in recent years. This suggests that the age distribution of tourists visiting India has remained relatively stable over the years, with consistent patterns observed across different age brackets.

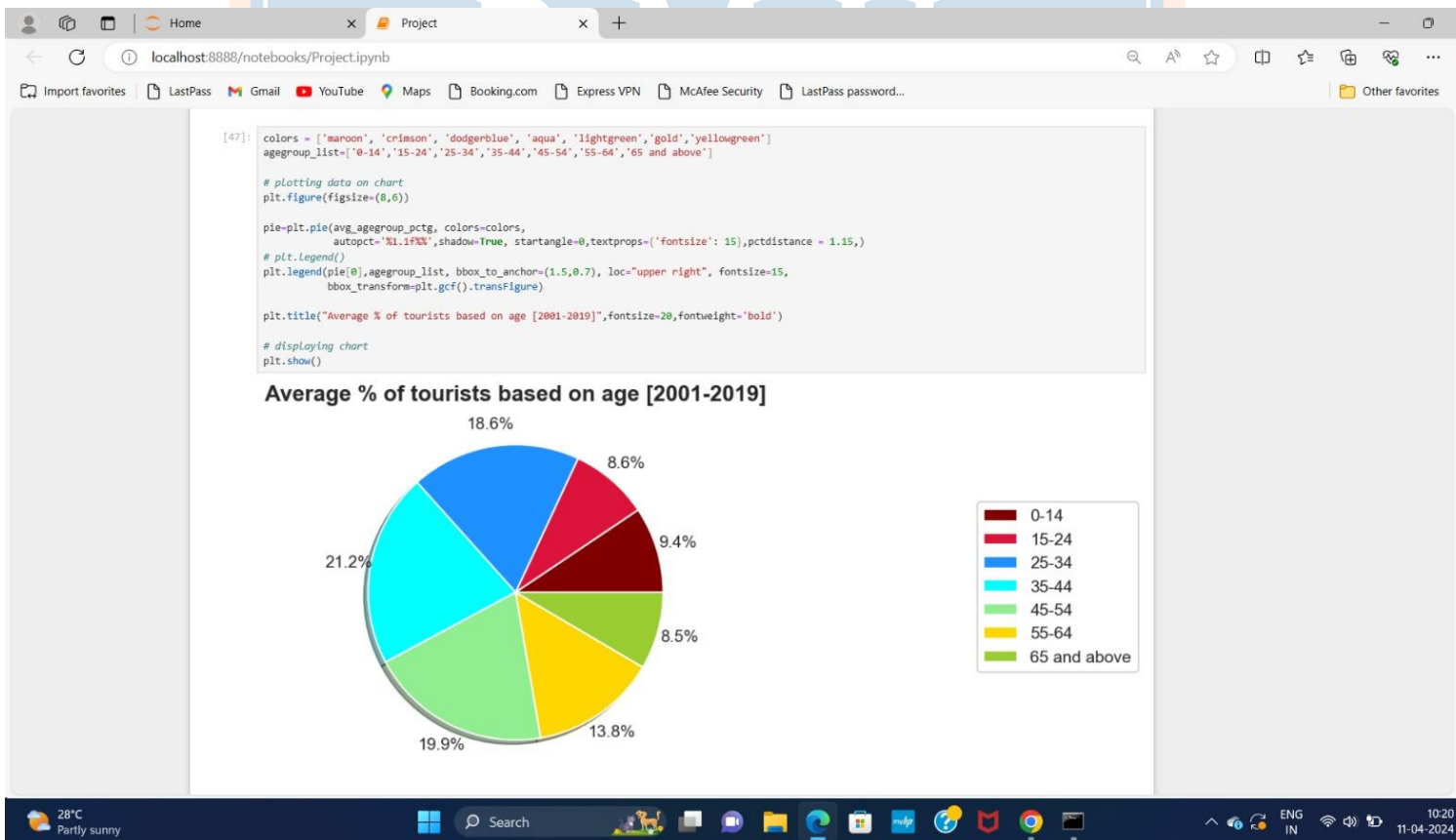
Highest and Lowest FTAs by Age Group: The age group of 35-44 years accounted for the highest number of FTAs, contributing 21.0% to the total. This indicates that individuals in their mid-30s to early 40s represent a significant portion of foreign tourists visiting India.

The age groups of 45-54 years and 25-34 years followed closely behind, indicating that individuals in their late 40s to early 50s and mid-20s to early 30s are also prominent segments of the tourist population in India.

Conversely, the age groups of 15-24 years and 65 & above contributed the lowest number of FTAs, each accounting for 8.7% of the total. This suggests that younger travelers (aged 15-24) and older travelers (aged 65 & above) are relatively less represented among foreign tourists visiting India.

Understanding the age distribution of foreign tourist arrivals in India helps tourism authorities, businesses, and stakeholders tailor their marketing strategies, products, and services to better cater to the needs and preferences of different age groups. By identifying the demographic segments that constitute the majority of tourists, India can develop targeted initiatives to attract and retain visitors, ultimately enhancing the overall tourism experience and driving growth in the sector.

3. Average %age distribution of Tourists based on age [2001 - 2019]



The insights derived from the multi-line plot provide valuable information about the age distribution of foreign tourist arrivals (FTAs) in India from 2001 to 2019. Here's a summary of the key findings:

Age Distribution: The majority of tourists visiting India during this period fell within the age range of late 20s to early 50s. This age group accounted for the highest proportion of FTAs, indicating that individuals in this demographic are more likely to travel to India.

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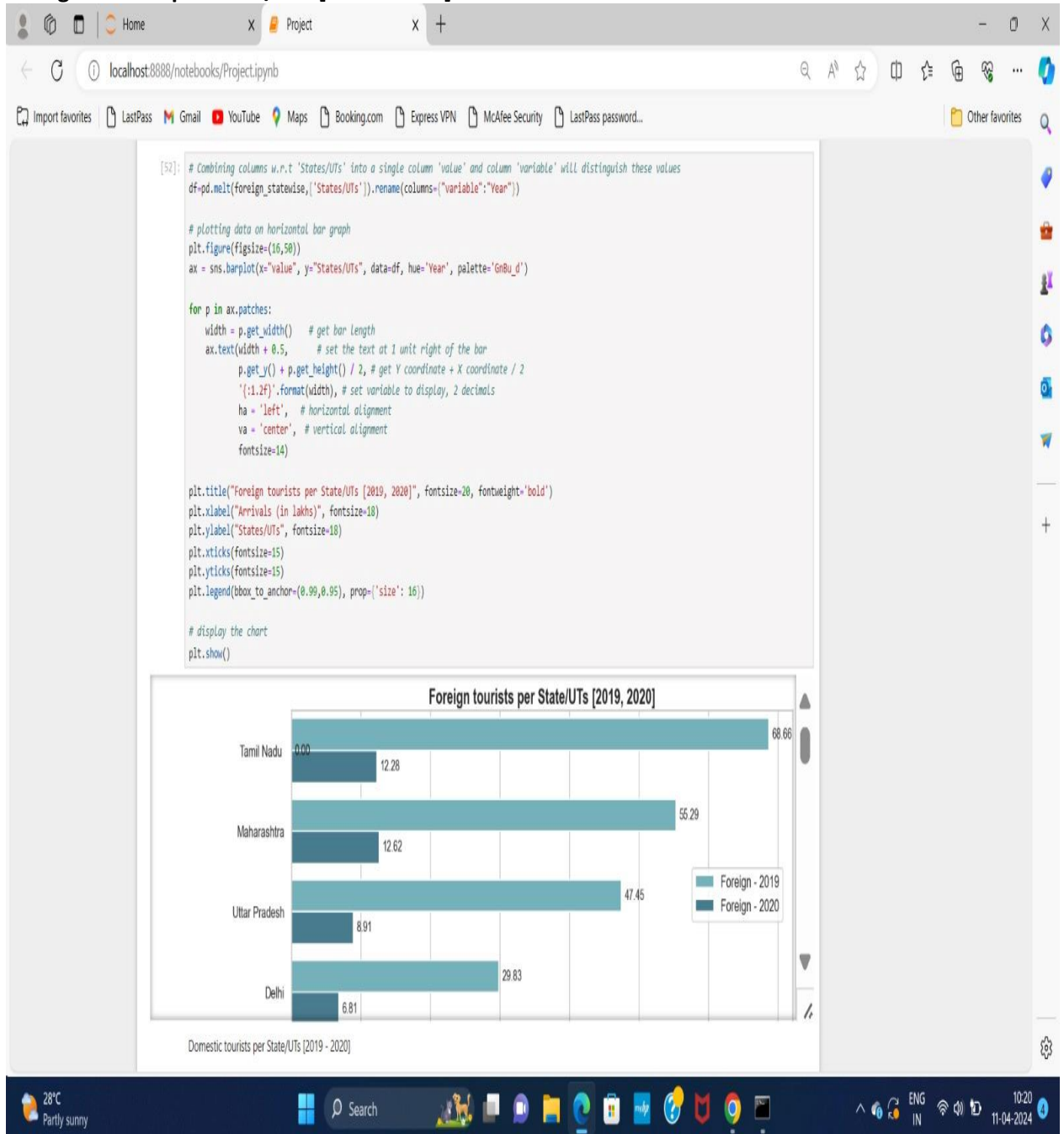
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F. Indian Tourism State Wise Statistics [2019 - 2020]:

1. Foreign tourists per State/UTs [2019 - 2020]



The analysis from the horizontal barplot provides valuable insights into the impact of COVID-19 on the tourism sector in various states of India, particularly focusing on Tamil Nadu. Here's a summary of the key points:

High Tourist Arrivals in 2019: In 2019, states such as Tamil Nadu, Maharashtra, Uttar Pradesh, and Delhi attracted the highest number of foreign tourists. These states likely derived significant revenue from tourism, indicating the importance of the tourism sector to their economies.

Drastic Decrease in 2020: However, in 2020, due to COVID-19 restrictions and travel bans, there was a drastic decrease in tourist arrivals, leading to a severe blow to the tourism sector in these states. The pandemic-induced disruptions, including lockdowns, travel restrictions, and safety concerns, resulted in a sharp decline in tourist traffic across the country.

Impact on Tamil Nadu: Tamil Nadu, in particular, boasts the largest tourism industry in India, with a notable percentage share of domestic and foreign tourist visits in the country. Therefore, the significant decrease in tourist traffic in 2020 had a profound impact on the tourism sector of Tamil Nadu. The state likely experienced substantial economic losses, job cuts, and disruptions to businesses reliant on tourism.

Long-term Implications: The decline in tourist arrivals in 2020 highlights the vulnerability of the tourism sector to external shocks such as pandemics. The long-term implications of this downturn may include reduced revenue, job losses, and challenges in reviving the sector post-pandemic.

Addressing the challenges faced by the tourism sector in Tamil Nadu and other states requires coordinated efforts from government agencies, tourism authorities, and industry stakeholders. Strategies such as promoting domestic tourism, implementing safety protocols, and diversifying tourism offerings can help mitigate the impact of future disruptions and support the recovery of the tourism sector.

2. Domestic tourists per State/UTs [2019 - 2020]:

The analysis of the tourism sector in Uttar Pradesh, particularly focusing on the impact of COVID-19, provides valuable insights into the state's tourism dynamics. Here's a summary based on the information provided:

Significant Domestic Tourism in 2019: In 2019, states like Uttar Pradesh, Tamil Nadu, Andhra Pradesh, and Karnataka attracted the highest number of domestic tourists, indicating significant revenue generation from domestic tourism in these states. Uttar Pradesh, in particular, emerged as the top state attracting domestic tourists, commanding a substantial share of India's tourist influx, totaling approximately 536 million domestic tourists.

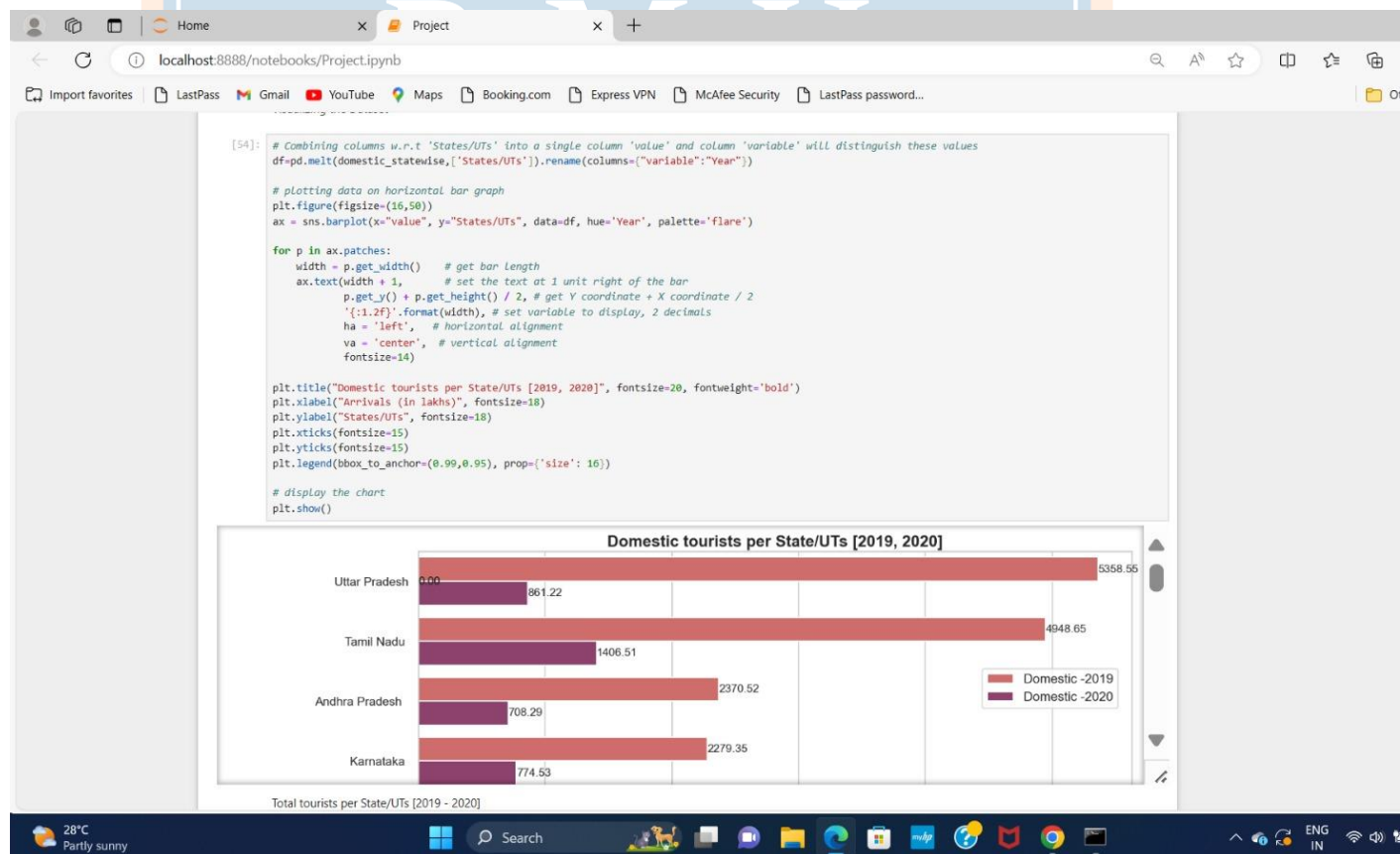
Impact of COVID-19 on Tourism: However, in 2020, due to COVID-19 restrictions and safety concerns, there was a significant decrease in tourist arrivals, leading to a substantial blow to the tourism sector in Uttar Pradesh and other states. The pandemic-induced disruptions severely limited tourism activity, resulting in a sharp decline in overall revenue generated from tourism, particularly domestic tourism, which plays a crucial role in India's tourism sector.

Severe Downturn in 2020: Uttar Pradesh's tourist traffic experienced a severe downturn following the outbreak

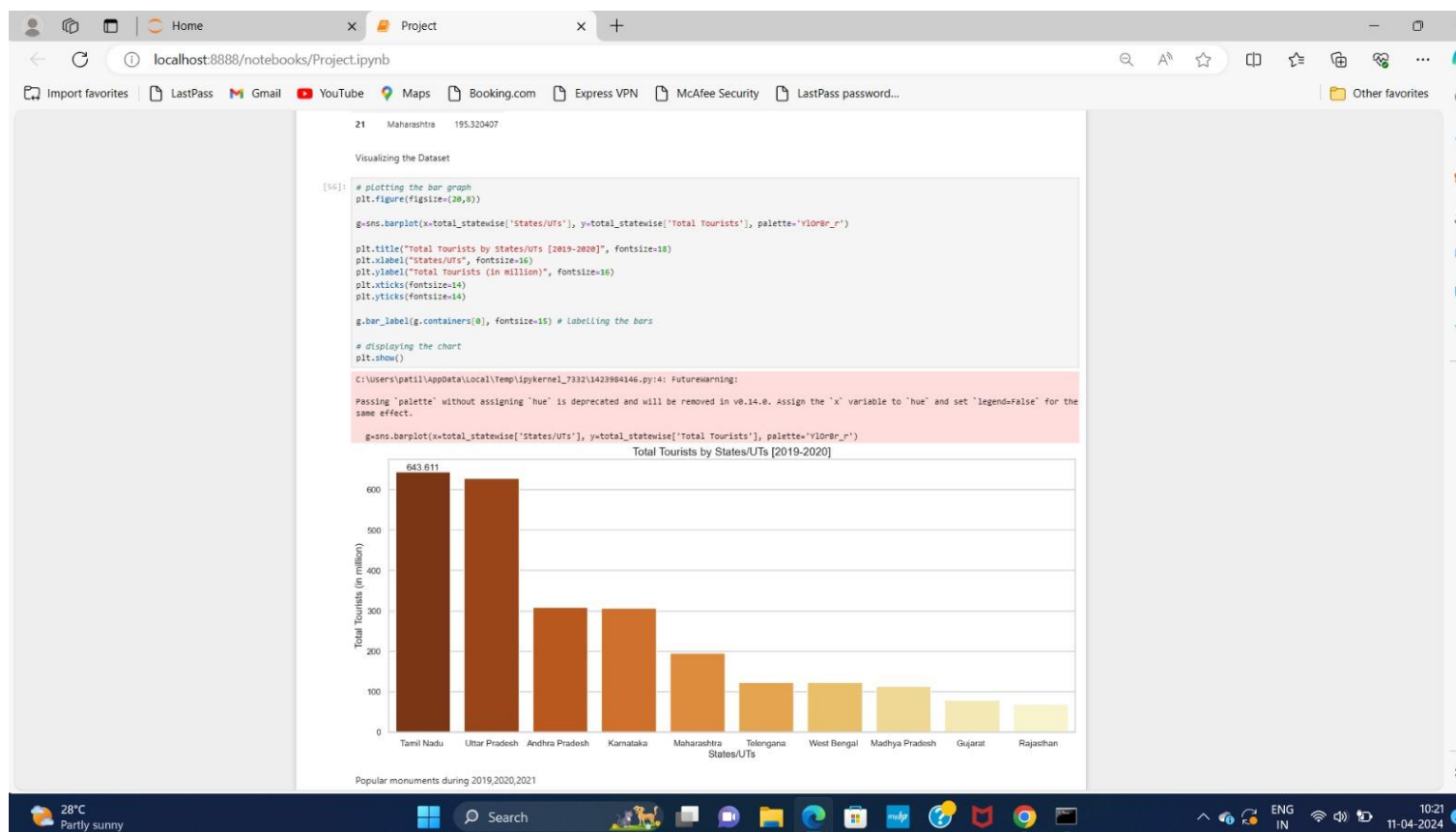
of the COVID-19 pandemic in 2020. The decline not only impacted tourism but also had repercussions on the revenue and employment opportunities associated with the sector. The state likely faced economic losses, job cuts, and disruptions to businesses reliant on tourism.

Long-term Implications: The decline in tourist arrivals in 2020 underscores the vulnerability of the tourism sector to external shocks such as pandemics. The long-term implications may include reduced revenue, job losses, and challenges in reviving the sector post-pandemic.

Addressing the challenges faced by the tourism sector in Uttar Pradesh requires concerted efforts from government agencies, tourism authorities, and industry stakeholders. Strategies such as promoting domestic tourism, implementing safety protocols, and diversifying tourism offerings can help mitigate the impact of future disruptions and support the recovery of the tourism sector in the state.



3. Total tourists per State/UTs [2019 - 2020]:



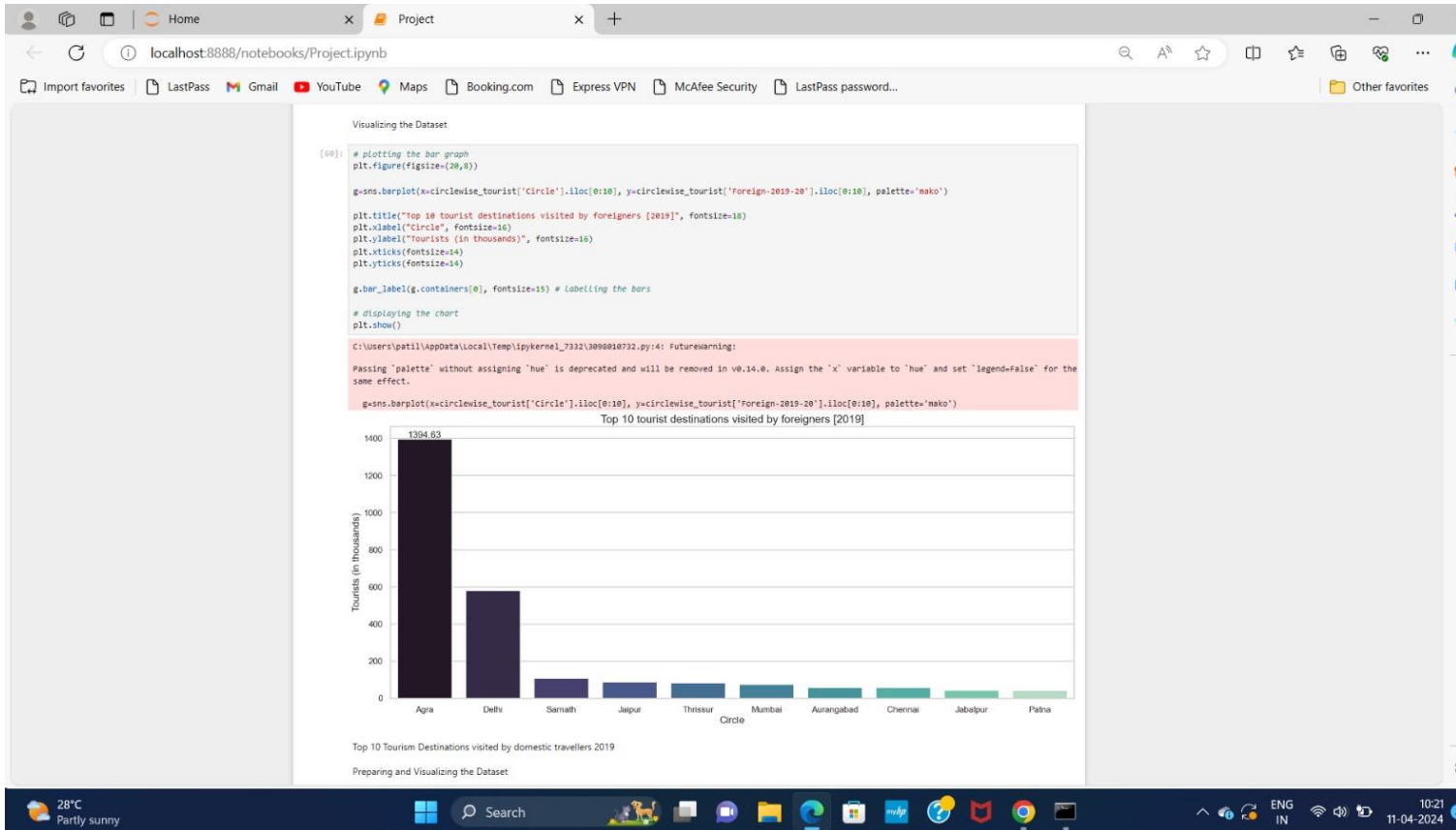
The inference drawn from the bar plot suggests that Tamil Nadu emerged as the top state in the tourism sector, followed by Uttar Pradesh, during the years 2019 and 2020. This trend appears to persist even now, indicating the continued prominence of these states in India's tourism landscape.

Tamil Nadu's leading position in the tourism sector is likely attributed to its diverse attractions, including historical monuments, cultural heritage sites, natural landscapes, and religious pilgrimage centers. Similarly, Uttar Pradesh's significant contribution to the tourism sector could be attributed to its rich historical and cultural heritage, including iconic landmarks such as the Taj Mahal, Agra Fort, and Varanasi.

The consistent performance of Tamil Nadu and Uttar Pradesh in the tourism sector underscores the importance of these states in driving tourism growth and revenue generation in India. By capitalizing on their unique tourism assets, enhancing infrastructure, and implementing effective marketing strategies, these states can continue to maintain their leadership positions in the tourism sector and contribute to the overall development of the industry in the country.

G. Popular monuments during 2019,2020,2021

1. Top 10 Tourism Destinations visited by foreigners 2019:

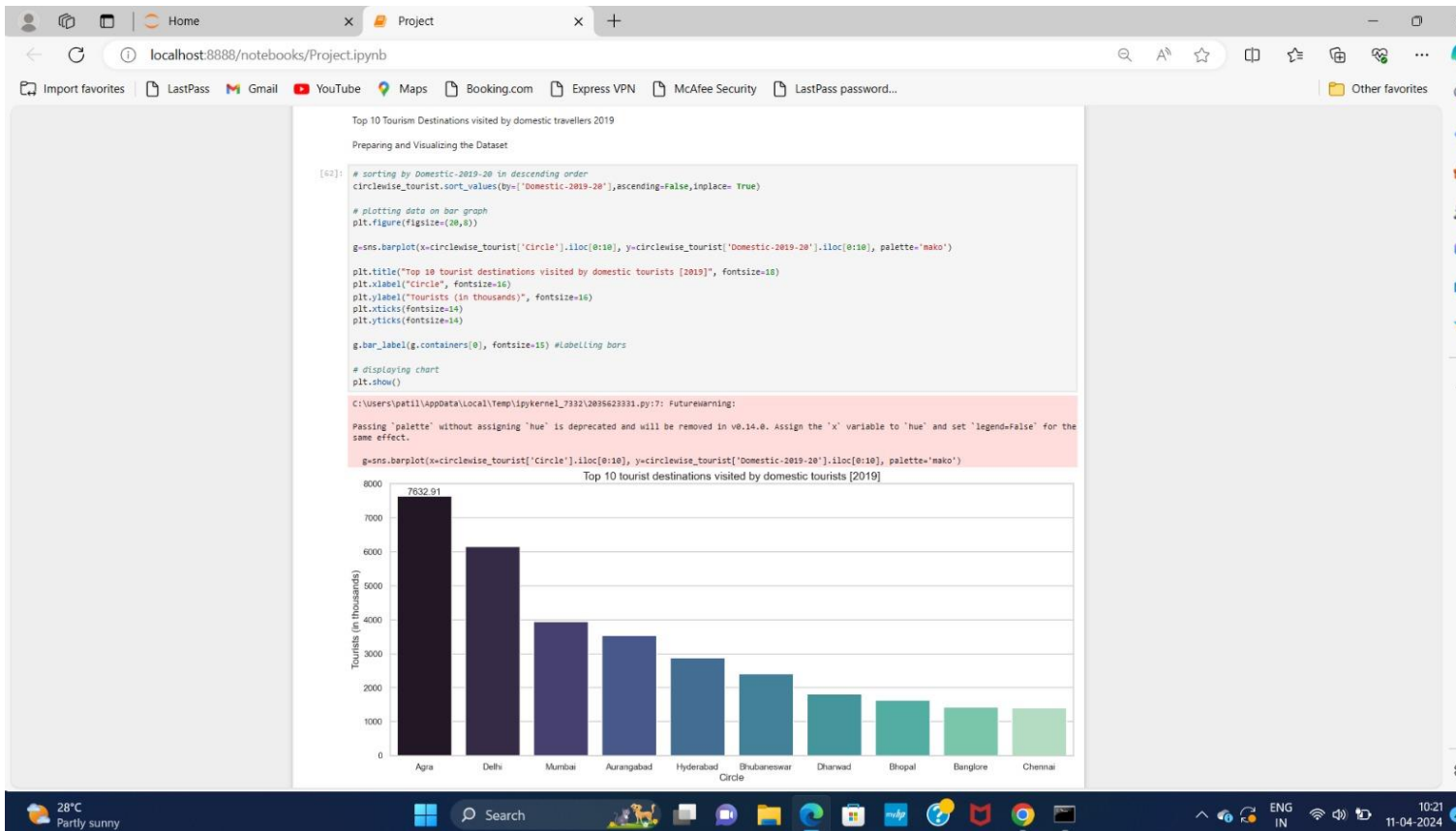


The analysis from the bar plot highlights the popularity of Agra as the most visited tourist destination, followed by Delhi. This trend can indeed be attributed to several factors:

1. **Taj Mahal in Agra:** Agra is home to the iconic Taj Mahal, one of the Seven Wonders of the World and a UNESCO World Heritage Site. The Taj Mahal's architectural beauty, historical significance, and cultural importance attract millions of tourists from around the globe each year. Its status as a symbol of love and its mesmerizing beauty make Agra a must-visit destination for travelers to India.
2. **Proximity to Delhi:** Delhi's close proximity to Agra, being just 200 kilometers away, enhances its appeal to tourists. Many tourists include both Agra and Delhi in their travel itineraries, taking advantage of the convenient transportation options between the two cities. Delhi serves as a gateway to Agra and other nearby destinations, further increasing its popularity among travelers.
3. **Rich Historical and Cultural Heritage:** Both Agra and Delhi boast rich historical and cultural heritage, with numerous monuments, landmarks, and attractions that captivate the interests of travelers. In addition to the Taj Mahal, Agra is home to other architectural marvels such as the Agra Fort and Fatehpur Sikri. Delhi, on the other hand, offers a blend of ancient history and modernity, with attractions like the Red Fort, Qutub Minar, and Jama Masjid.
4. **Combined Appeal:** The combination of Agra's Taj Mahal and Delhi's diverse attractions makes this region a prime destination for tourists visiting India. Travelers can experience the grandeur of Mughal architecture in Agra and explore the vibrant culture, cuisine, and heritage of Delhi, making it a comprehensive and enriching travel experience.

Overall, the popularity of Agra and Delhi in the tourism sector can be attributed to Their iconic landmarks, rich history, cultural significance, and accessibility, making them essential destinations for travelers exploring India.

2. Top 10 Tourism Destinations visited by domestic travellers 2019:



The observation drawn from the bar plot suggests a consistent pattern in the popularity of tourist destinations among domestic travelers, with Agra and Delhi remaining the top choices. This pattern contrasts with other popular tourist zones, which may be newer destinations and not as popular among foreign tourists. Here's an analysis of this observation:

Agra and Delhi as Top Destinations: Agra and Delhi continue to attract a significant number of domestic travelers, reflecting their enduring appeal and significance in India's tourism landscape. The presence of iconic landmarks such as the Taj Mahal in Agra and historical monuments in Delhi makes them perennial favorites among domestic tourists seeking cultural and heritage experiences.

Newer Destinations for Domestic Travelers: In contrast to Agra and Delhi, other popular tourist zones may represent newer destinations that are gaining traction among domestic travelers. These destinations might offer unique attractions, cultural experiences, or recreational activities that appeal to domestic tourists but may not be as well-known or visited by foreign tourists.

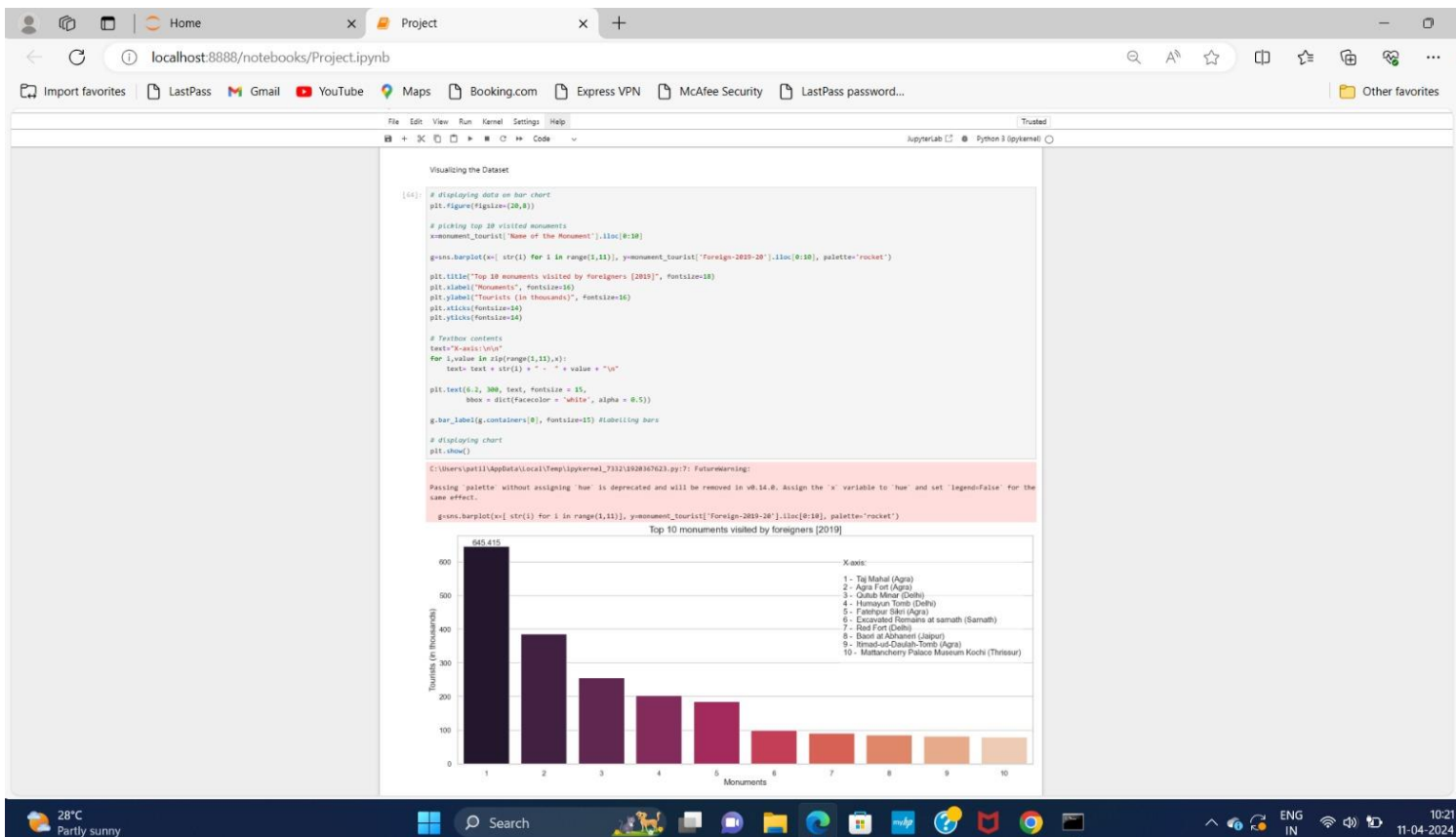
Heritage and Infrastructure: The popularity of tourist destinations among domestic travelers may be influenced by factors such as heritage significance, accessibility, infrastructure development, and marketing efforts. While Agra and Delhi boast rich historical and cultural heritage, newer destinations may offer modern amenities, adventure tourism opportunities, or eco-friendly experiences to attract domestic tourists.

Divergence in Preferences: The divergence in preferences between domestic and foreign travelers highlights the diverse interests and motivations driving tourism in India. Domestic travelers may prioritize familiar destinations with cultural and historical significance, while foreign tourists may seek off-the-beaten-path experiences or destinations aligned with specific interests or trends.

Overall, the observation underscores the dynamic nature of India's tourism sector, with a mix of iconic landmarks and emerging destinations catering to the diverse preferences of domestic and foreign travelers. Understanding these patterns can inform tourism planning, marketing strategies, and infrastructure development to sustain growth and enhance visitor experiences across different destinations.



3. Top 10 Monuments visited by foreigners 2019:



The observation drawn from the bar plot aligns with the concentration of popular monuments visited by foreign tourists in Agra and Delhi. The Taj Mahal, one of the Seven Wonders of the World, stands out as the most famous landmark among them. Here's an analysis based on this observation:

Concentration of Popular Monuments: Agra and Delhi are renowned for their rich historical and cultural heritage, which is reflected in the concentration of popular monuments visited by foreign tourists in these cities. These destinations offer a wealth of iconic landmarks, architectural marvels, and historical sites that attract visitors from around the world.

Taj Mahal's Global Fame: The Taj Mahal, located in Agra, holds immense significance as a symbol of love and architectural brilliance. Its status as one of the Seven Wonders of the World and a UNESCO World Heritage Site elevates its global fame and allure. Foreign tourists often prioritize visiting the Taj Mahal during their trips to India, contributing to its status as one of the most visited monuments in the world.

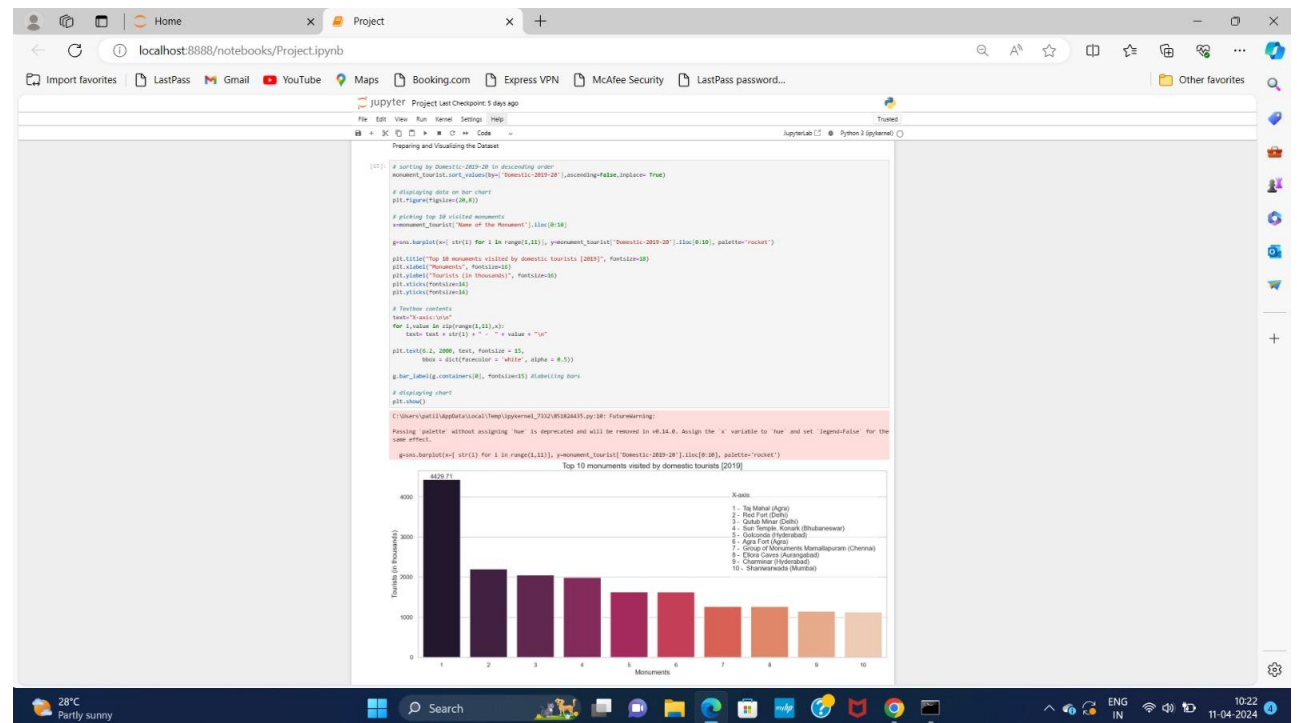
Historical and Cultural Significance: Delhi, the capital city of India, is home to numerous historical monuments, including the Red Fort, Qutub Minar, Humayun's Tomb, and Jama Masjid, among others. These monuments showcase India's rich heritage and cultural diversity, attracting foreign tourists seeking immersive cultural experiences and architectural wonders.

Tourism Promotion and Infrastructure: The popularity of monuments in Agra and Delhi among foreign tourists can also be attributed to effective tourism promotion efforts, improved infrastructure, and accessibility. These cities have well-developed tourism infrastructure, including accommodation options, transportation facilities, and guided tours, catering to the needs of international visitors.

Overall, the concentration of popular monuments in Agra and Delhi, with the Taj Mahal as the standout attraction, underscores the significance of these cities in India's tourism sector. By capitalizing on their cultural heritage, historical significance, and iconic landmarks, Agra and Delhi continue to attract visitors from across the globe, contributing to India's tourism economy and cultural diplomacy efforts.



4. Top 10 Monuments visited by domestic travellers 2019:



The bar plot highlights the popularity of monuments in Agra and Delhi, along with the intriguing interest shown by domestic travelers towards lesser-known monuments. This suggests that while Agra and Delhi's iconic landmarks attract significant attention, there is also growing interest in exploring lesser-known sites among domestic tourists.

Moreover, the concentration of popular tourist destinations in North India, as depicted in these plots, does not indicate that other regions of India are lagging behind. As evidenced by the popular tourism state plots, Tamil Nadu, renowned for its magnificent temples, stands out as the state with the highest tourist influx across India. Following Tamil Nadu, South Indian states such as Andhra Pradesh and Karnataka also attract a substantial number of tourists.

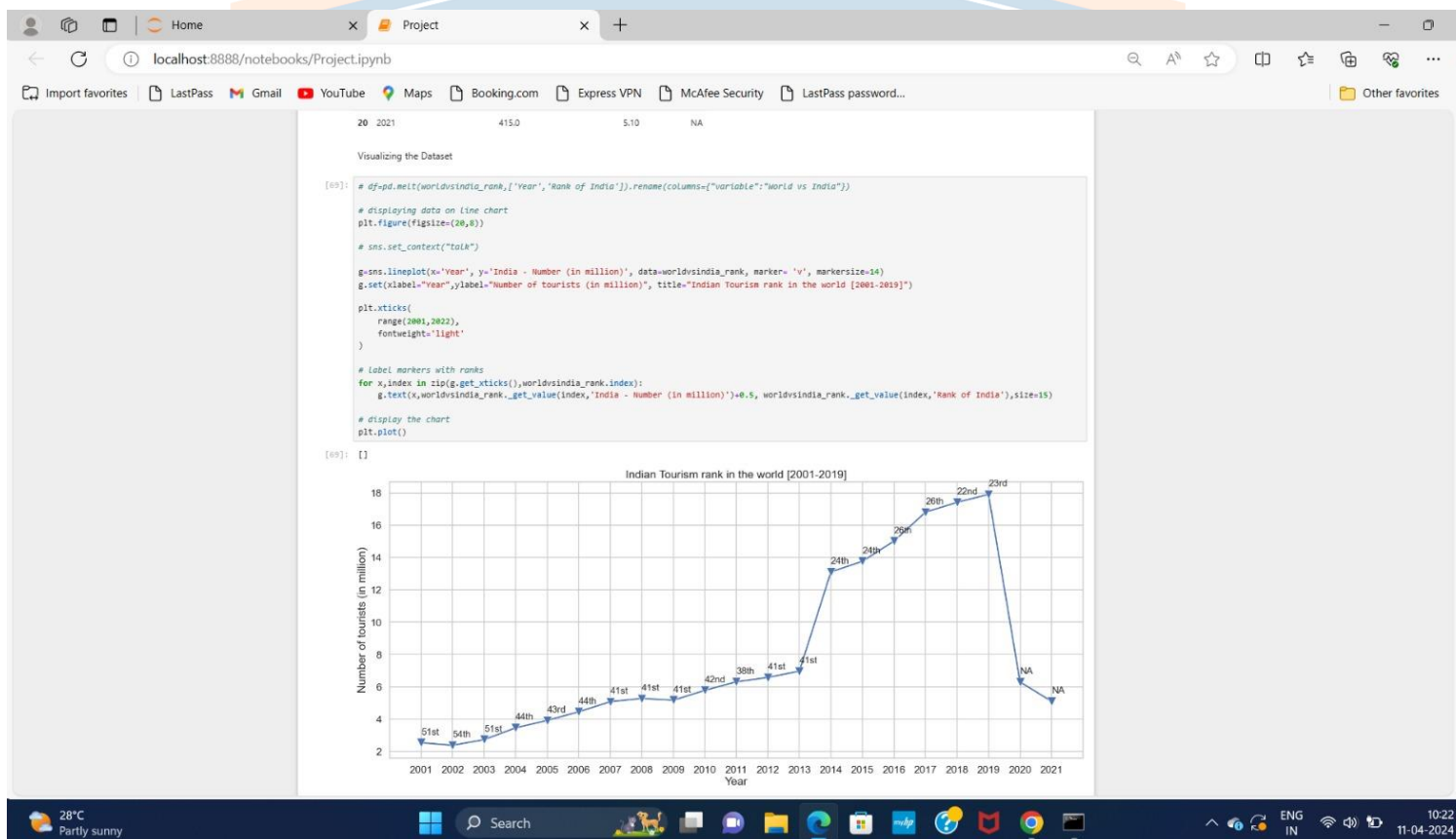
These observations underscore the diversity and richness of India's tourism landscape, with different regions offering unique attractions and experiences that cater to the varied interests of travelers. While North India's monuments hold immense appeal, South India's cultural and natural treasures equally captivate tourists, showcasing the country's vibrant tourism potential across its diverse geographical and cultural spectrum.

You're absolutely correct. North-East India indeed faces various challenges that hinder its tourism potential. Insufficient funds, lack of infrastructure, transportation issues, limited alternative means of transport, inadequate marketing efforts, boundary disputes, security concerns, and restrictive permit requirements are some of the significant obstacles faced by the region's tourism sector.

However, North-East India possesses immense tourism potential, boasting some of the most breathtaking and diverse landscapes in the country. From the majestic Himalayan peaks to the lush plains of Assam and the pristine forests and waterfalls of Meghalaya, the region offers a treasure trove of natural beauty and cultural richness waiting to be explored.

If the government takes proactive steps to address these challenges and invest in the development of infrastructure, transportation networks, marketing campaigns, and resolving boundary disputes, it can unlock the full tourism potential of North-East India. By doing so, not only would justice be done to the tourism sector of these states, but it would also open up new economic opportunities, promote cultural exchange, and showcase the region's unparalleled natural and cultural heritage to the world.

H. Position of Indian Tourism in the world [2001 - 2021]-



Your analysis provides a succinct overview of the trajectory of Indian tourism, highlighting both its positive growth trajectory and the significant impact of the COVID-19 pandemic. Here's a breakdown of the key points:

Steady Improvement Until 2020: The line plot illustrates a steady improvement in Indian tourism over time, indicating a positive trend in tourist arrivals and activity. This growth trajectory underscores the resilience and attractiveness of India as a tourism destination, with increasing numbers of tourists visiting the country each year.

Inclusion of NRIs in Tourism Statistics: Since the inclusion of Non-Resident Indians (NRIs) in India's tourism statistics in 2014, there has been a notable increase in the number of tourists visiting India. This inclusion has not only contributed to the overall growth of Indian tourism but has also improved India's position in the global tourism landscape, reflecting a more accurate representation of tourist arrivals and activity in the country.

Impact of COVID-19: The COVID-19 pandemic brought about a significant downturn in tourism activity worldwide, including in India. Travel restrictions, lockdowns, and safety concerns resulted in a sharp decline in tourist arrivals, severely impacting India's tourism sector. The sudden halt to the positive growth trajectory experienced in previous years highlights the vulnerability of the tourism industry to external shocks and crises.

Importance of Accurate Tourism Data: Despite the setback caused by the pandemic, the inclusion of NRIs in tourism statistics has underscored the importance of accurately capturing and analyzing tourist data for informed decision-making and strategic planning in the tourism industry. Accurate data allows stakeholders to assess trends, identify areas for improvement, and develop targeted interventions to support the recovery and growth of the tourism sector.

Overall, your analysis emphasizes the resilience of Indian tourism, the challenges posed by the COVID-19 pandemic, and the significance of data-driven approaches in navigating the evolving landscape of the tourism industry. Moving forward, leveraging accurate data and implementing strategic interventions will be essential for revitalizing and sustaining the growth of India's tourism sector.



System testing

Code Execution: Verify that the Python code executes without any errors.

Data Integrity: Check that the dataset used for analysis is complete, accurate, and up-to-date.

Data Cleaning: Confirm that the data cleaning process removes any inconsistencies, missing values, or outliers that could affect the analysis.

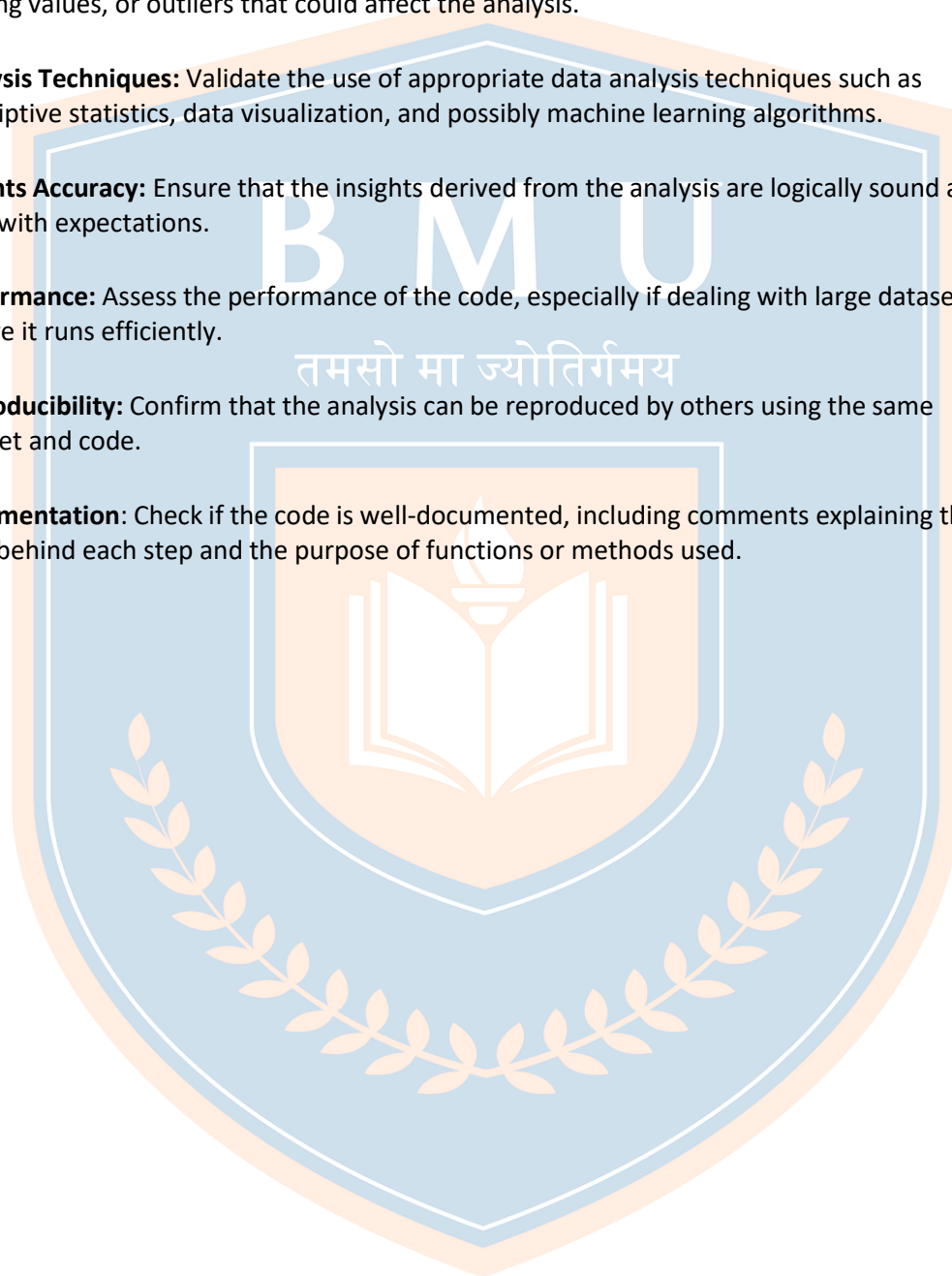
Analysis Techniques: Validate the use of appropriate data analysis techniques such as descriptive statistics, data visualization, and possibly machine learning algorithms.

Insights Accuracy: Ensure that the insights derived from the analysis are logically sound and align with expectations.

Performance: Assess the performance of the code, especially if dealing with large datasets, to ensure it runs efficiently.

Reproducibility: Confirm that the analysis can be reproduced by others using the same dataset and code.

Documentation: Check if the code is well-documented, including comments explaining the logic behind each step and the purpose of functions or methods used.



5.Conclusion

Indian tourism has witnessed significant development since 2010, driven by increased investments in both domestic and foreign tourism sectors. This growth has been facilitated by upgrades in transportation infrastructure, advancements in hotel management systems, and enhancements across various tourism components.

Despite facing challenges such as the impact of the COVID-19 pandemic, India has made strides in establishing itself as a prominent tourism destination. With concerted efforts and continued investment in the tourism industry, India has the potential to regain its former glory and further enhance its position in the global tourism landscape.

Moving forward, it is imperative for India to focus on improving tourism infrastructure, promoting sustainable tourism practices, enhancing visitor experiences, and leveraging technology to attract tourists from around the world. By prioritizing these efforts, India can capitalize on its rich cultural heritage, diverse landscapes, and unique attractions to drive sustained growth and prosperity in the tourism sector.



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