Introduction

The digital landscape is ever-evolving, and understanding website traffic is critical for making informed decisions and optimizing online performance. In this report, we delve into the analysis of website traffic data to uncover valuable insights that can drive strategic decisions. Our analysis covers four main areas.

Data Collection and Preparation:

Gather website traffic data from analytics tools and prepare it for analysis.

Clean the data by handling missing values, duplicates, and inconsistencies.

Convert data into a suitable format and ensure consistent date/time formatting.

Data Source:

A good data source for website traffic analysis using machine learning should be Accurate, Complete, Accessible.

Dataset: (" https://www.kaggle.com/datasets/bobnau/daily-website-visitors ")

Date	Row	Day	Day.Of.Week	Page.Loads	Unique.Visits	First.Time.Visits	Returning.Visits
2014-09-14	1	Sunday	1	2146	1582	1430	152
2014-09-15	2	Monday	2	3621	2528	2297	231
2014-09-16	3	Tuesday	3	3698	2630	2352	278
2014-09-17	4	Wednesday	4	3667	2614	2327	287
2014-09-18	5	Thursday	5	3316	2366	2130	236
...	...	...	...	...	...	...	...
2020-08-15	2163	Saturday	7	2221	1696	1373	323
2020-08-16	2164	Sunday	1	2724	2037	1686	351
2020-08-17	2165	Monday	2	3456	2638	2181	457
2020-08-18	2166	Tuesday	3	3581	2683	2184	499
2020-08-19	2167	Wednesday	4	2064	1564	1297	267

Exploratory Data Analysis (EDA):

Explore the dataset to understand its characteristics.

Calculate basic statistics for key metrics (e.g., page views, bounce rate, conversions).

Create visualizations (e.g., histograms, time series plots) to identify trends, distributions, and outliers.

Perform correlation analysis to uncover relationships between variables (e.g., time on site vs. conversions).

Visualization

Use Python libraries such as Pandas, Matplotlib, Seaborn, Plotly, and others to analyze and visualize your website traffic data.

You can create various types of visualizations like line charts, bar charts, heatmaps, and more to gain insights into user behavior, traffic patterns, and other relevant metrics.

Program:

```
import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

data = pd.read_csv('/kaggle/input/daily-website-visitors/daily-website-visitors.csv')

cols_to_plot = ['Page.Loads', 'Unique.Visits', 'First.Time.Visits', 'Returning.Visits']
```
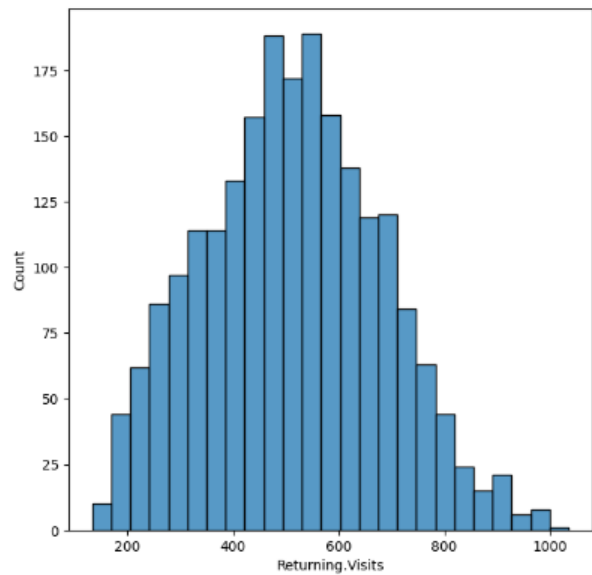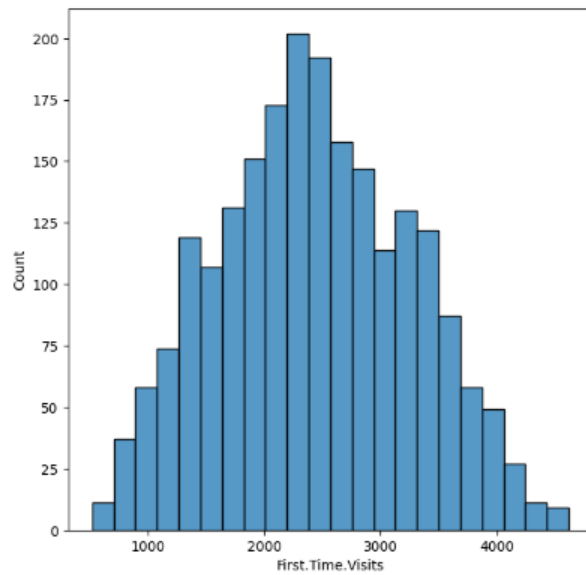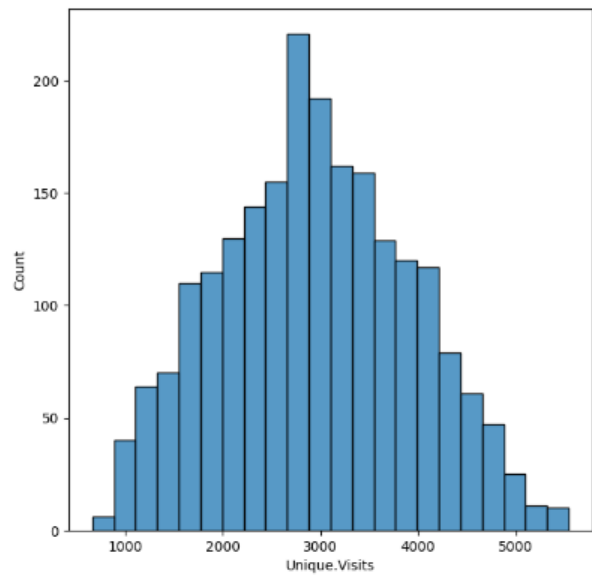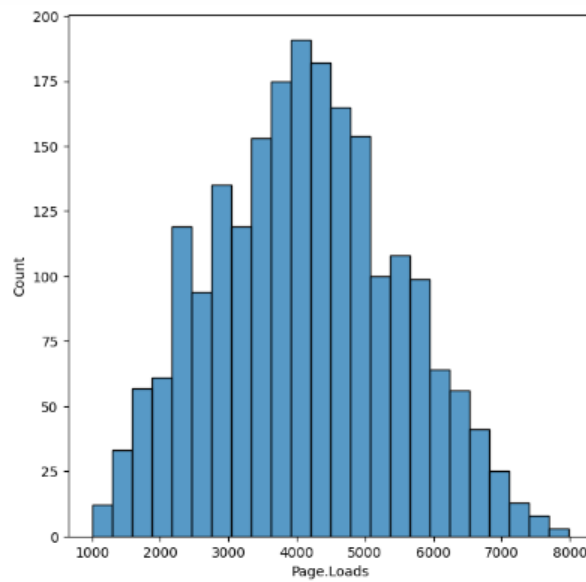
```
plt.figure(figsize=(15, 15))

for i, col in enumerate(cols_to_plot):

    plt.subplot(2, 2, i+1)

    sns.histplot(data=data, x=col)
```

Model Selection and Training:

Choose an appropriate machine learning model based on your objectives. For example, you can use regression for numeric predictions or classification for categorizing visitors.

Train the selected model on the training data using algorithms like linear regression, decision trees, or logistic regression.

Model Evaluation:

Evaluate the model's performance on the testing dataset using relevant evaluation metrics. For regression tasks, you might use Mean Absolute Error (MAE) or Mean Squared Error (MSE). For classification, consider metrics like accuracy, precision, recall, or F1-score.

Visualize model results and compare predicted values with actual data to understand performance.

Interpretation:

Interpret the model's results to gain insights into website traffic patterns.

Identify key drivers of website traffic, such as traffic sources, content quality, or seasonality.

Use these insights to inform decision-making, optimize marketing strategies, improve user experiences, and make data-driven changes to the website.

Conclusion:

Website traffic analysis provides valuable insights into user behaviour, traffic sources, and content performance. As the digital landscape continues to evolve, ongoing analysis and adaptation will be key to maintaining a successful online presence.