Website Performance Analysis with Python

Hands-on project analyzing real website data using Python

LEARNING OBJECTIVES

Data Cleaning

Clean and preprocess website user data

Exploratory Analysis

Perform comprehensive EDA

Traffic Insights

Uncover patterns, bounce rates € engagement

Visualizations

Create stunning charts with Pandas, Matplotlib € Seaborn

Tools & Technologies

Python

Core programming language

Pandas & NumPy

Data manipulation

Matplotlib & Seaborn

Data visualization

Jupyter Notebook

Interactive development

ANALYSIS QUESTIONS

Key Questions to Answer

01

Traffic Patterns

What trends exist in sessions and users over time?

02

Channel Performance

Which marketing channel drives highest traffic?

03

Engagement Analysis

Which channel has highest average engagement time?

04

Engagement Variation

How does engagement rate vary across channels?

05

Session Quality

Which channels drive more engaged sessions?

06

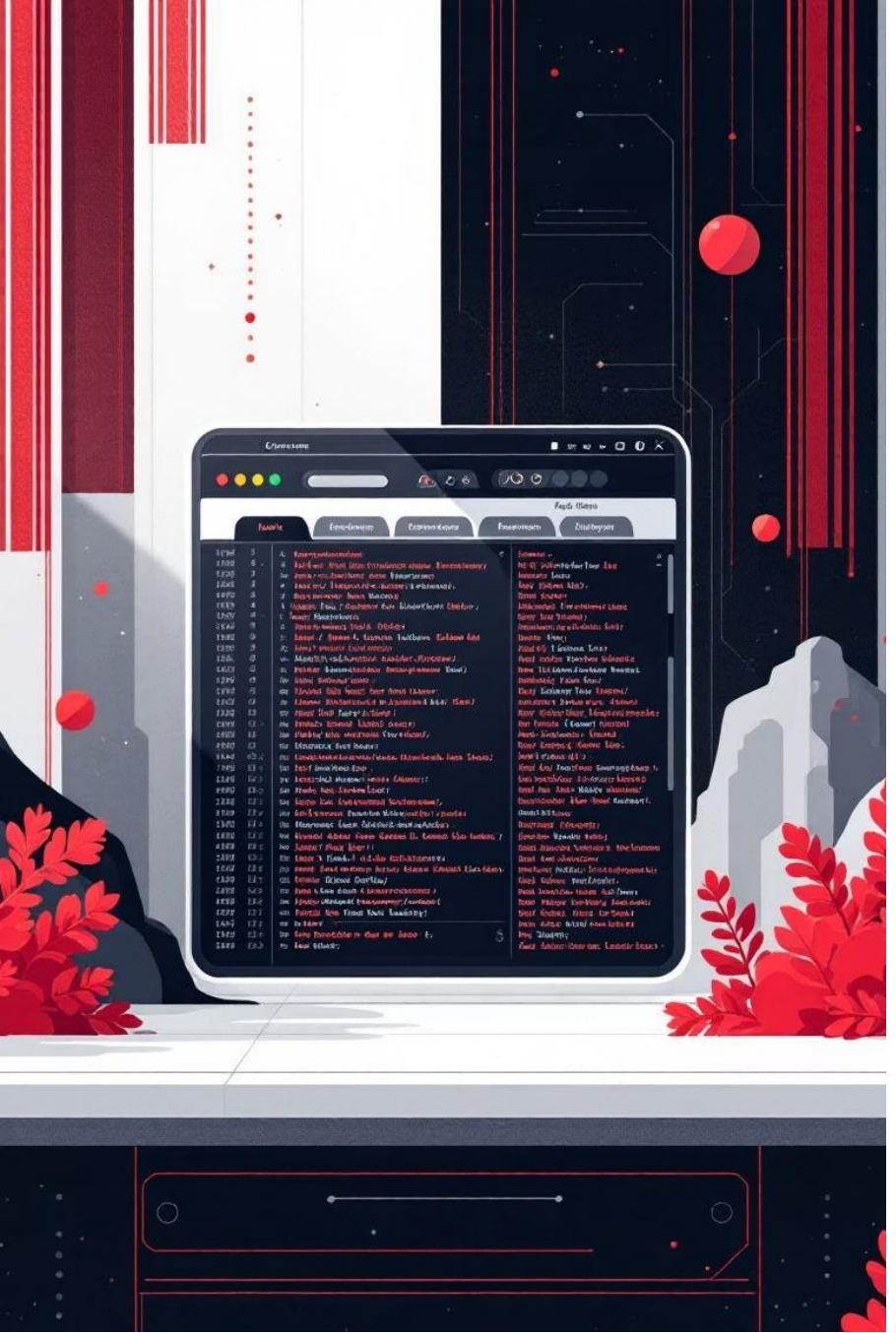
Hourly Patterns

At what hours does each channel drive most traffic?

07

Correlation

Is there correlation between high traffic and engagement?



</> DATA PREPARATION

Cleaning & Validation

Load Data

Import CSV with Pandas

Fix Columns

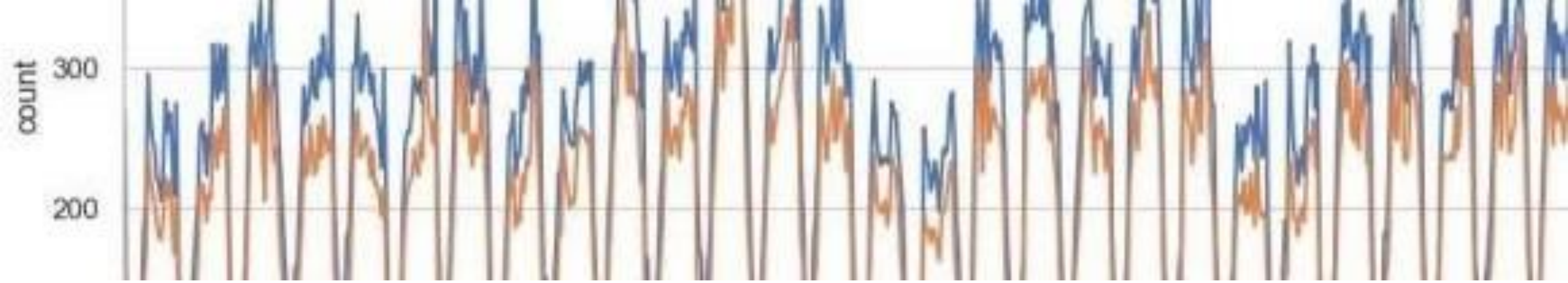
Rename and restructure

Convert Types

DateTime & numeric conversion

Validate

3,182 entries ready



Sessions & Users Over Time

Both metrics show high volatility with peaks and troughs throughout April 2024

3182

Total Records

Hourly data points analyzed

500

Peak Sessions

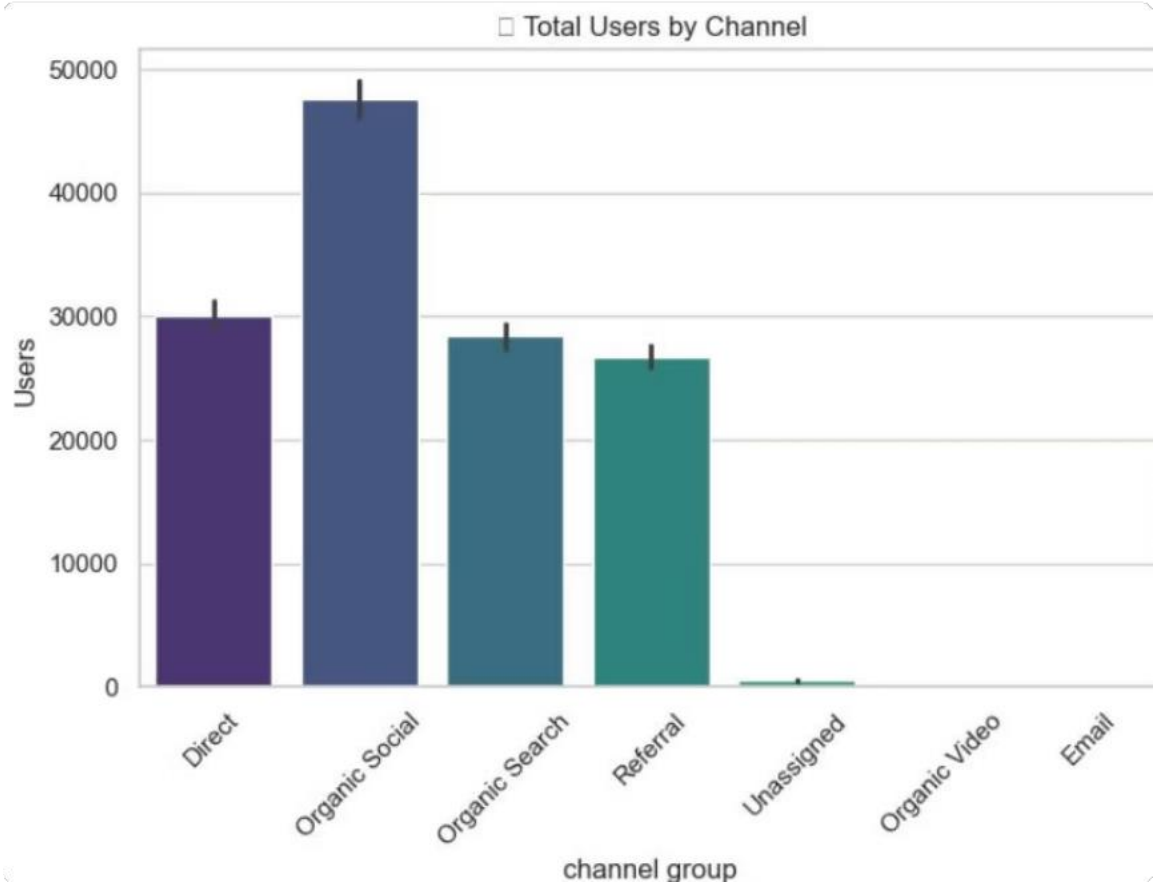
Maximum hourly sessions

28

Days Tracked

April 6 - May 3, 2024

Total Users by Channel



Organic Social Dominates

48,000 users - highest traffic source

Direct: 30K

Second largest channel

Organic Search: 28K

Strong SEO performance

Referral: 27K

Partnership traffic

Average Engagement Time by Channel

Organic Video: 180s

Highest engagement - users spend 3x more time

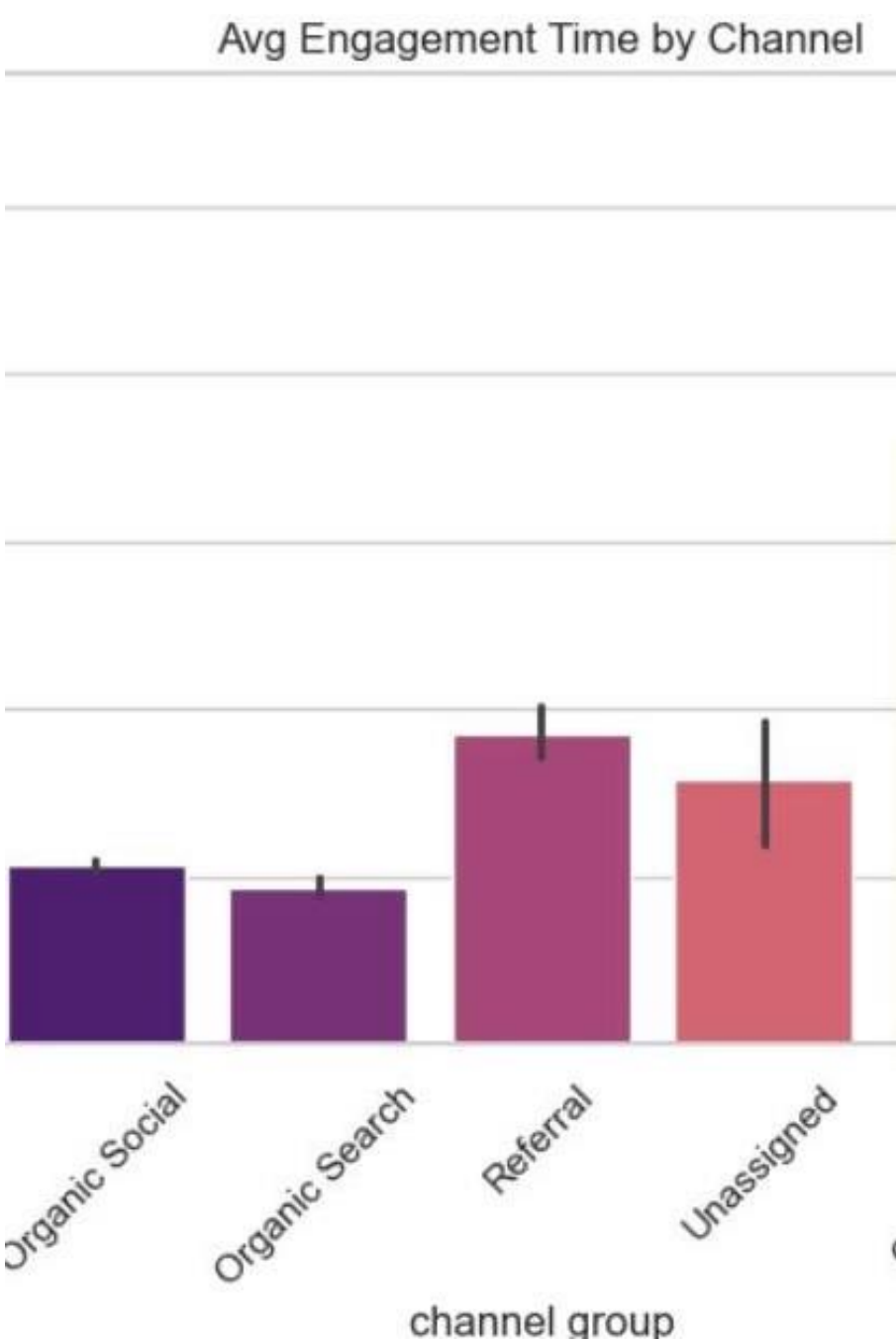
Referral: 92s

Quality traffic from partnerships

Email: 75s

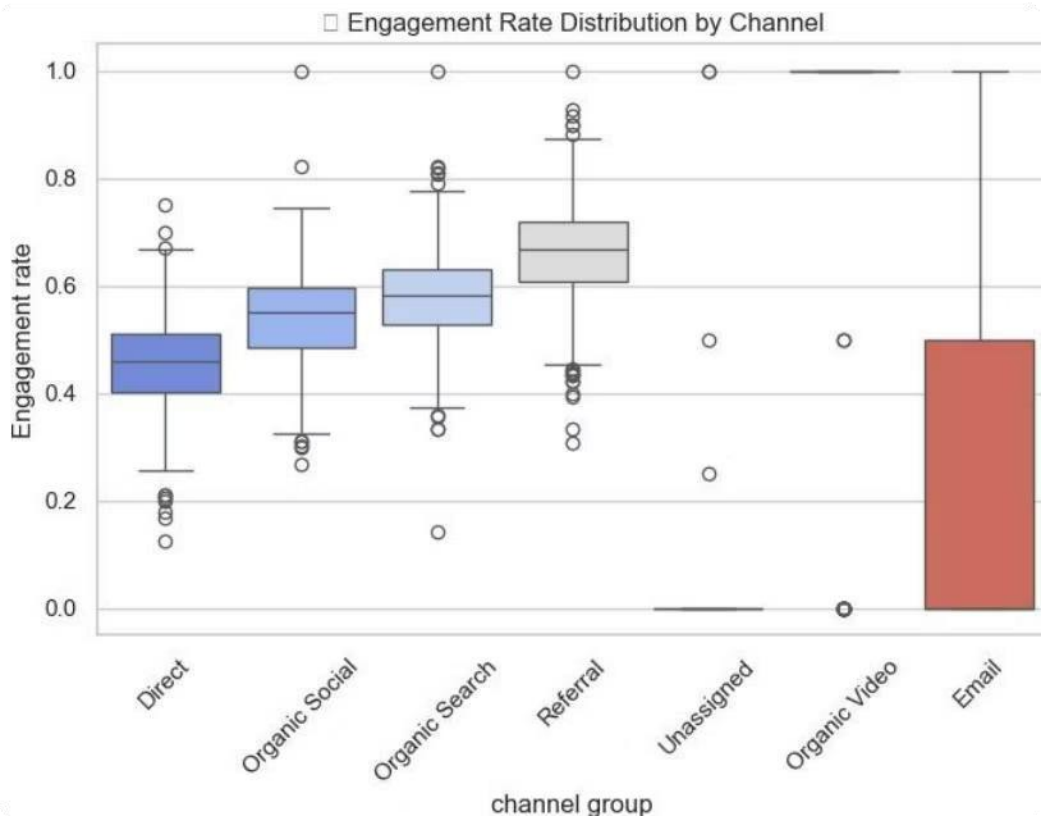
Targeted audience engagement

Video content drives significantly longer engagement times

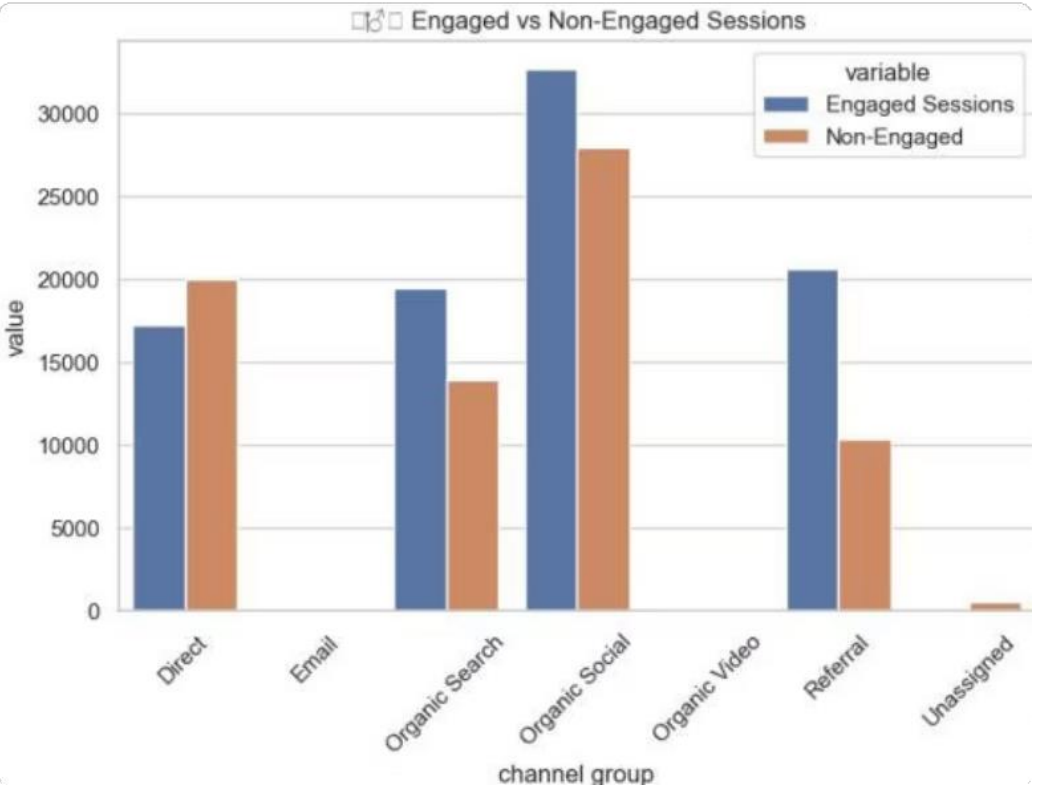


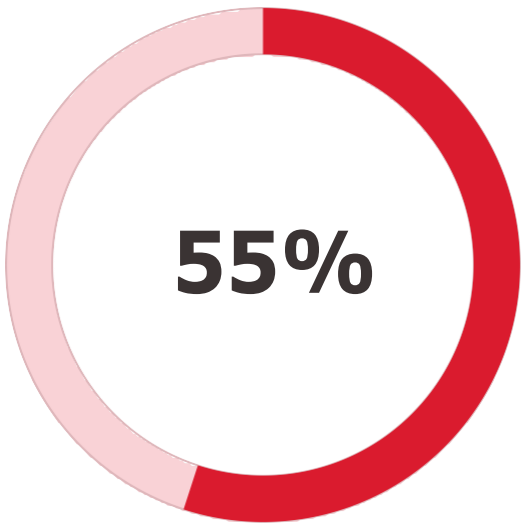
Engagement Rate & Session Quality

Distribution by Channel



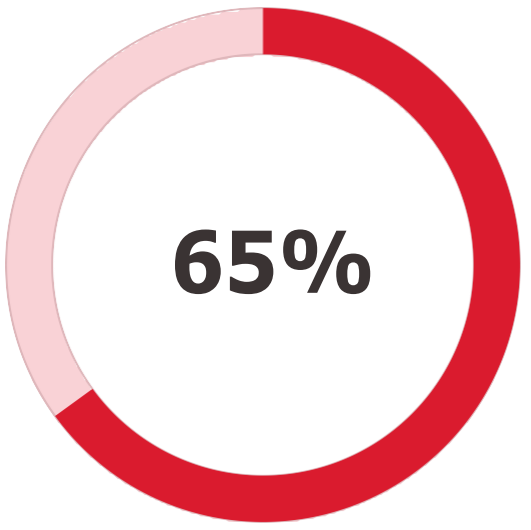
Engaged vs Non-Engaged





Average Engagement Rate

Across all channels



Referral Engagement

Highest median rate

Traffic Patterns & Correlations

1 **Peak Hours**

Evening hours (19-23) show highest traffic across channels

2 **Channel Timing**

Organic Social peaks at 3,500 sessions during prime hours

3 **Engagement Correlation**

High traffic doesn't always mean high engagement rate

Key Insight: Optimize content strategy for evening hours when user engagement peaks. Focus on Organic Video and Referral channels for quality engagement.