

In [1]: *# Importing necessary libraries*

```
import pandas as pd
import numpy as np
import datetime as dt
import plotly.io as pio
import plotly.express as px
import plotly.graph_objects as go
pio.templates.default = "plotly_white"
```

In [2]: *# Read CSV input file*

```
df = pd.read_csv("../Dataset//CBA.csv")
```

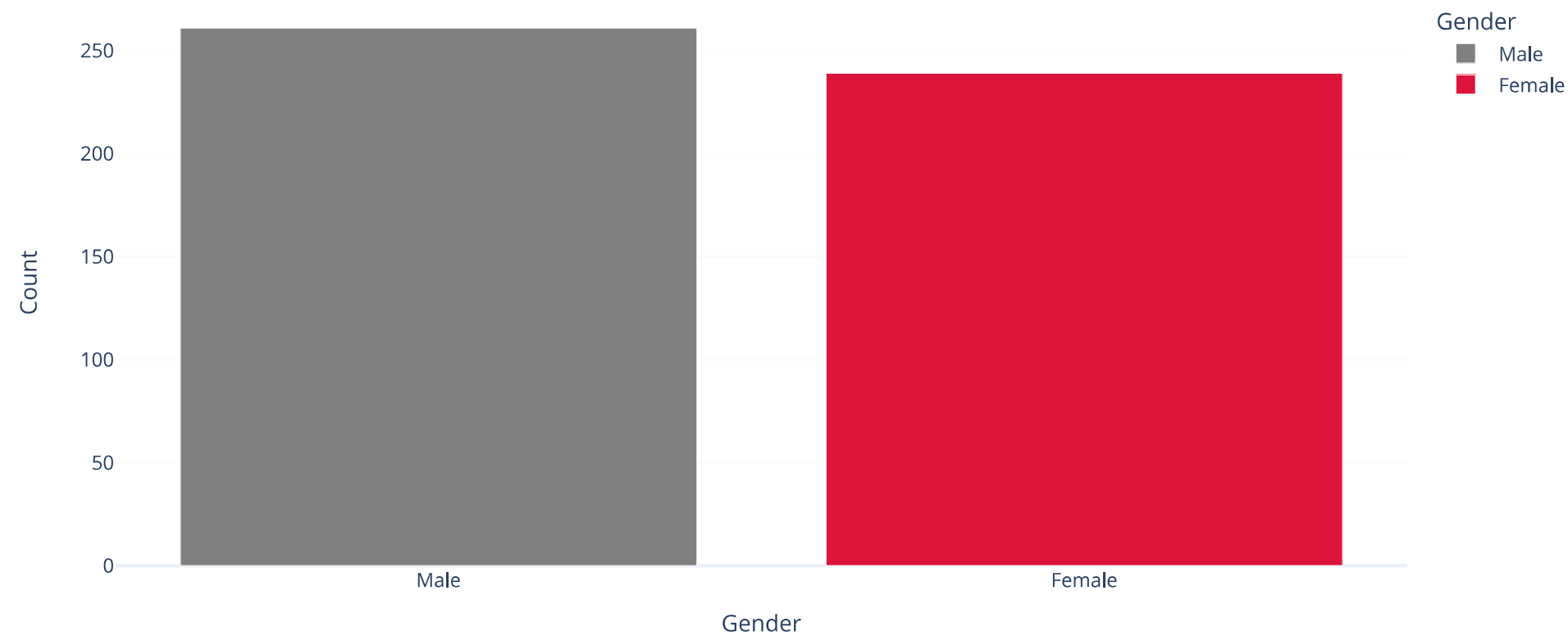
*# Renaming the columns*

```
df.rename(columns={"Product_Browsing_Time" : "Product_Browsing_Time(in Mins)"}, inplace= True)
```

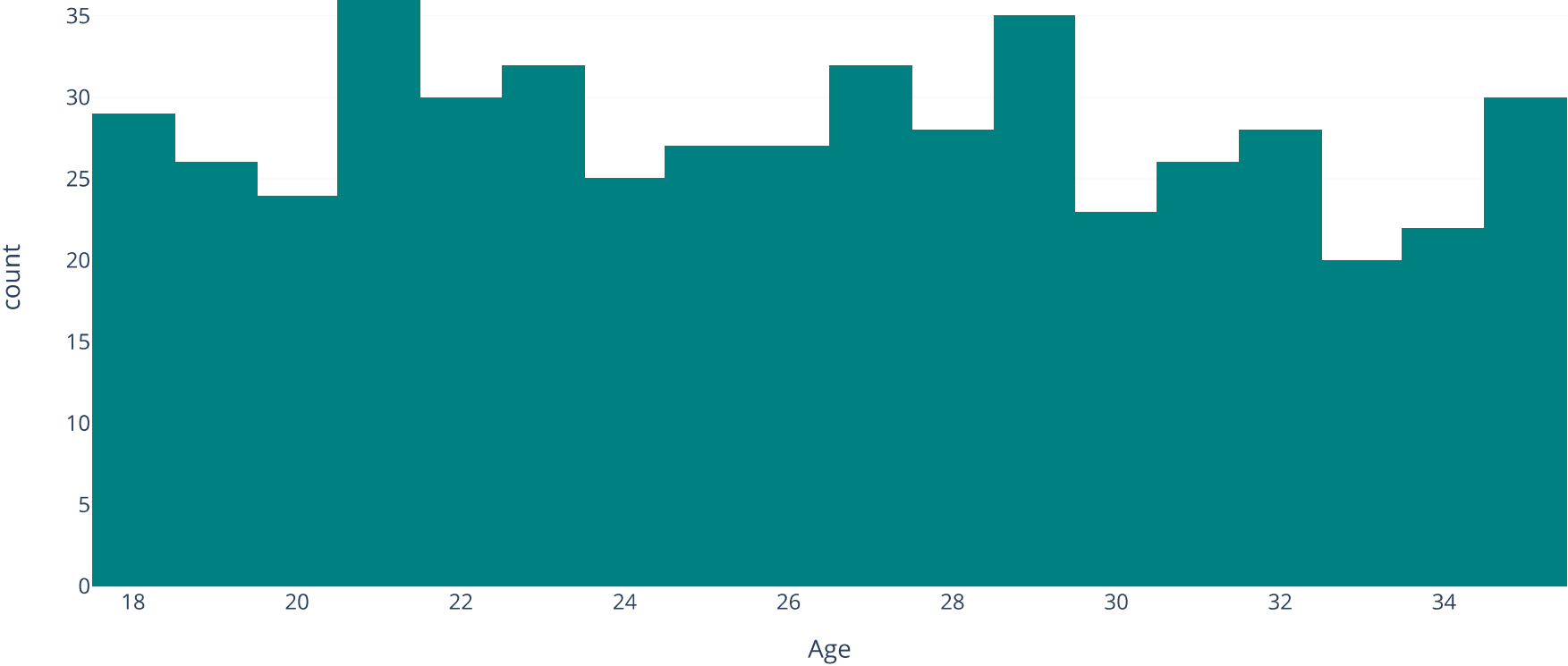
In [3]: *# Distribution based on Gender, Age*

```
custom_colors = {  
    'Female': 'crimson',  
    'Male' : 'gray'  
}  
  
# Gender  
gender_counts = df['Gender'].value_counts().reset_index()  
gender_counts.columns = ['Gender', 'Count']  
fig = px.bar(gender_counts, x='Gender', y='Count', color='Gender', color_discrete_map=custom_colors, title='Distribution of Gender')  
fig.show()  
  
# Age  
  
fig = px.histogram(df, x="Age", color_discrete_sequence=['teal'], title= "Distribution of Age" )  
fig.show()
```

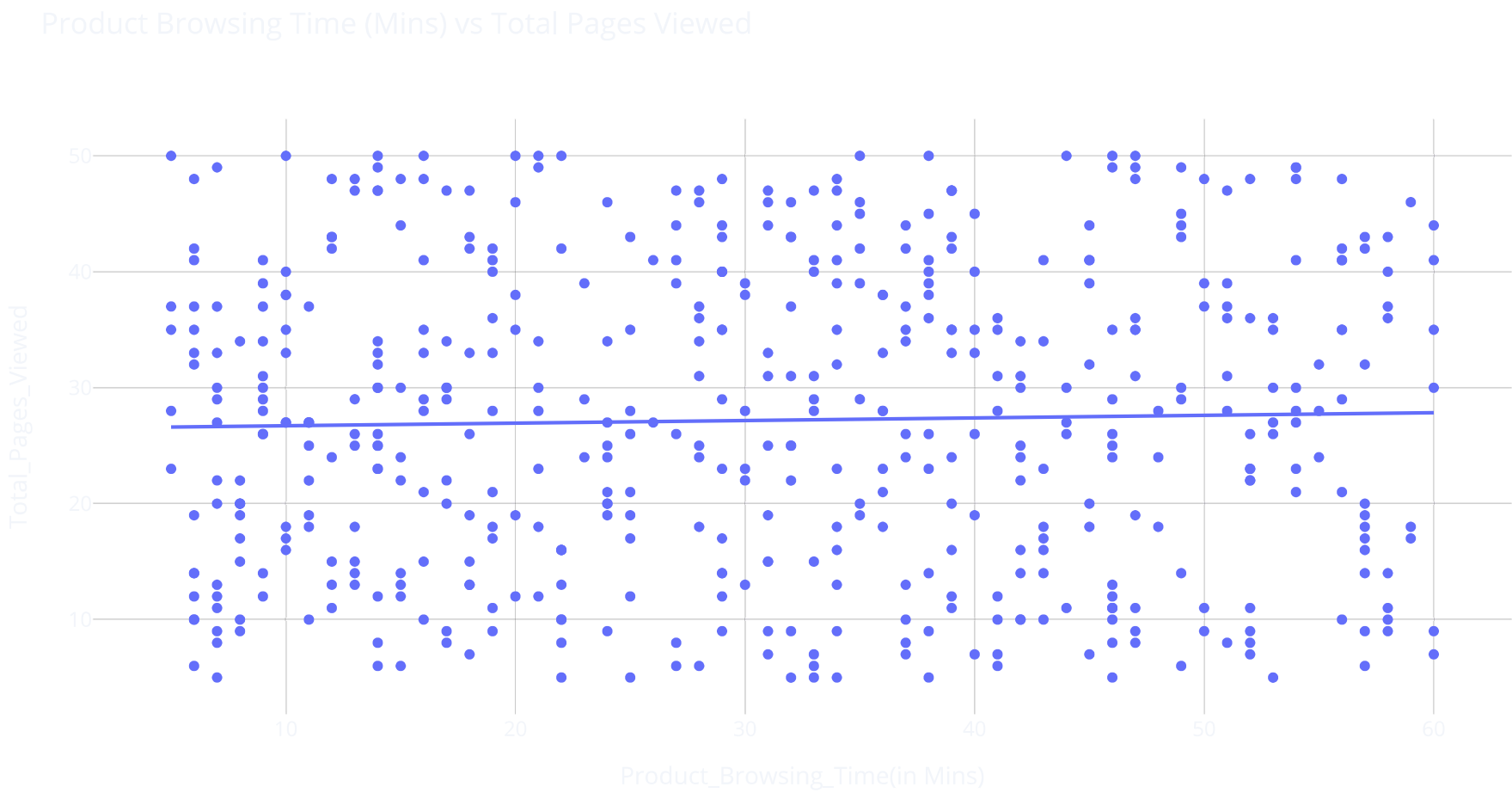
Distribution of Gender



Distribution of Age



```
In [4]: # Relationship between Product browsing time and total pages viewed
pio.templates.default = "plotly_dark"
fig = px.scatter(df, x = 'Product_Browsing_Time(in Mins)', y = "Total_Pages_Viewed",title = "Product Browsing Time (Mins) vs Total Pages Viewed", trendline = "ols")
fig.show()
```

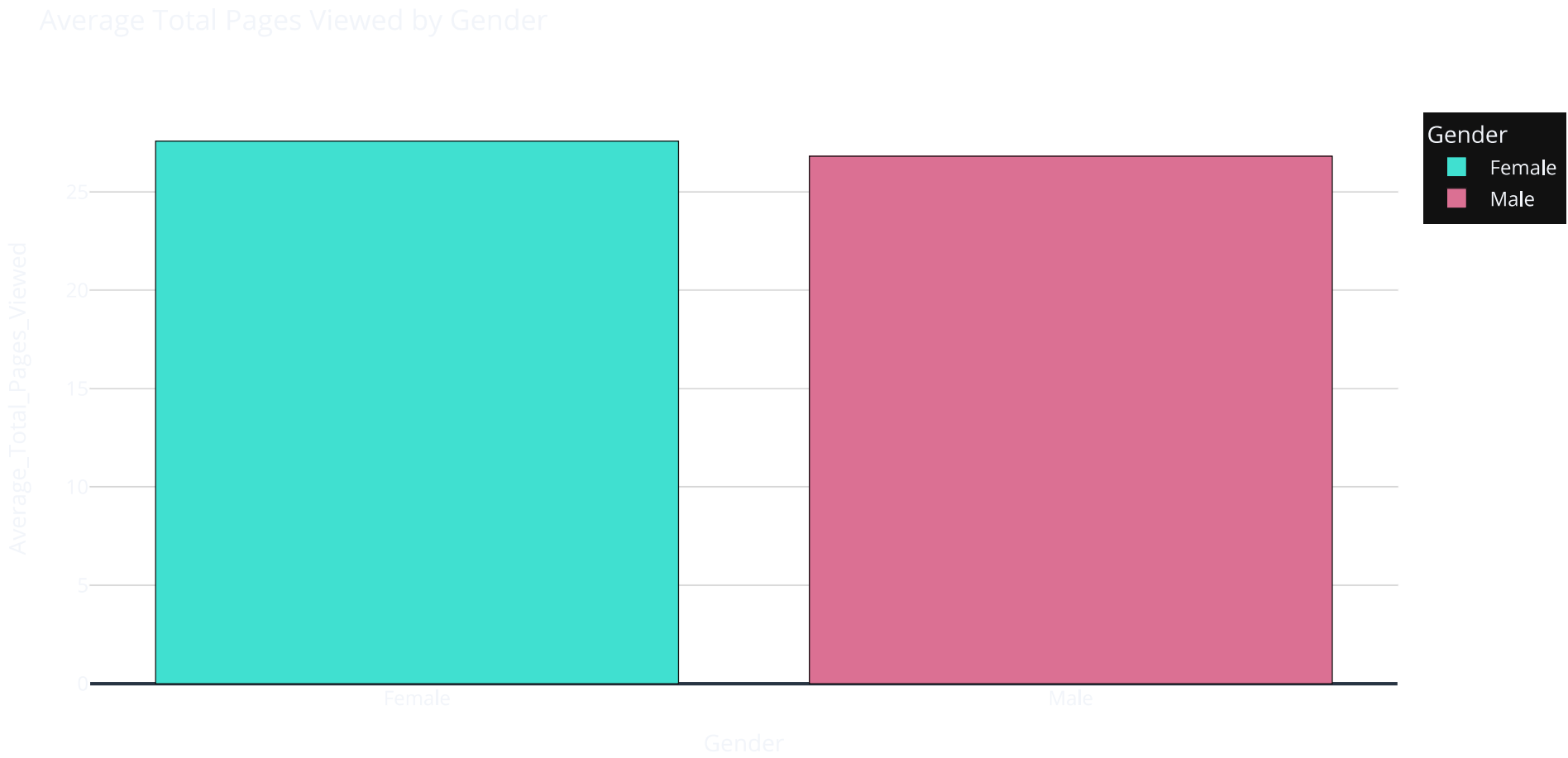


The scatter plot above doesn't reveal a consistent trend or significant correlation between the duration of product browsing and the overall page views. This suggests that users aren't consistently navigating through more pages when they spend longer periods on the website. Possible reasons for this could include factors like website layout, the relevance of content, or the unique preferences of individual users.

```
In [5]: # Pages viewed as per gender

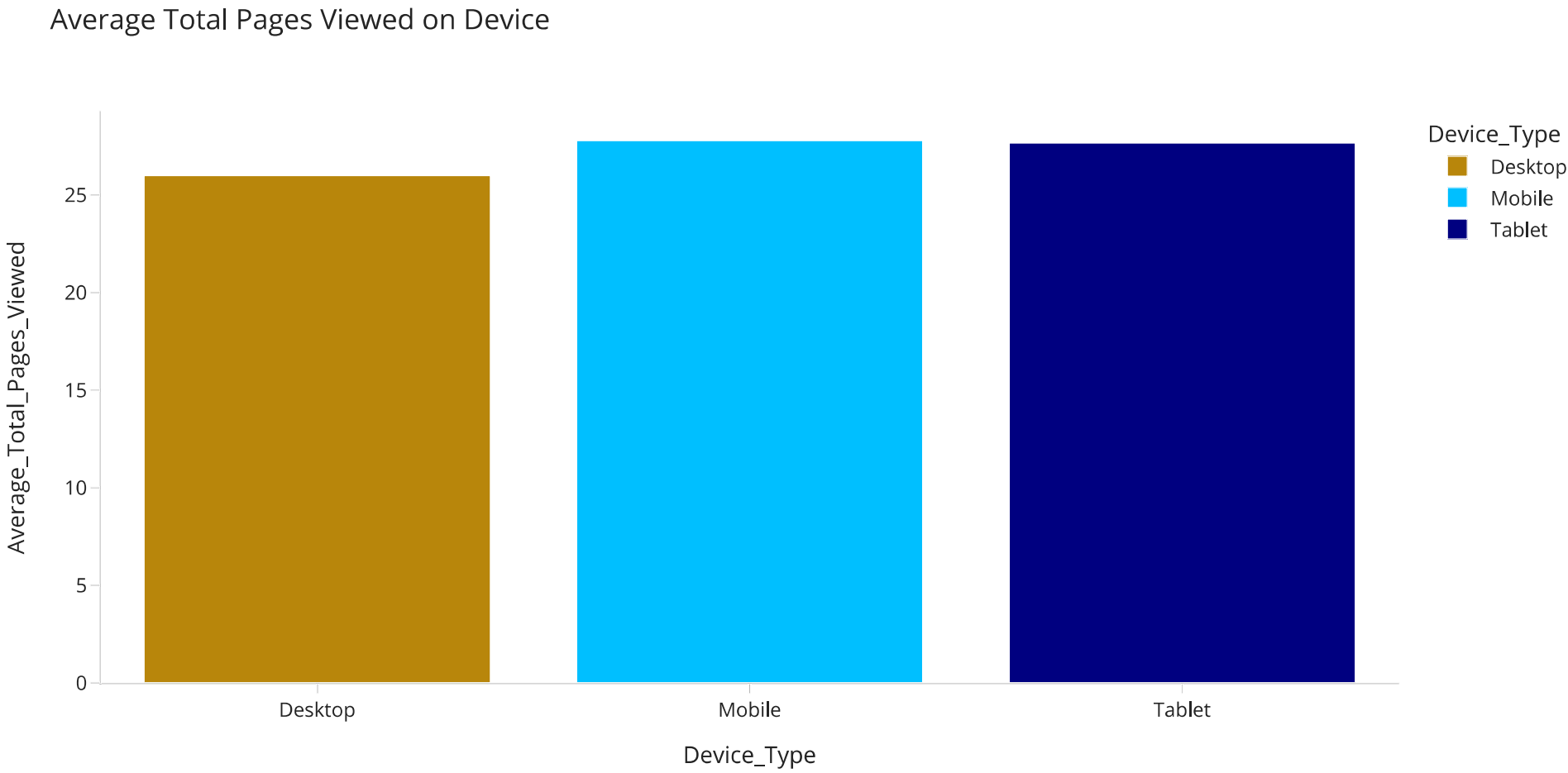
custom_colors = {
    'Female': 'turquoise',
    'Male' : 'palevioletred'
}

gender_group = df.groupby("Gender")["Total_Pages_Viewed"].mean().reset_index()
gender_group.columns = ['Gender', 'Average_Total_Pages_Viewed']
fig = px.bar(gender_group, x='Gender', y='Average_Total_Pages_Viewed', color='Gender',color_discrete_map=custom_colors,
             title='Average Total Pages Viewed by Gender')
fig.show()
```



```
In [6]: # Pages viewed as per device

custom_colors = {
    'Desktop': 'darkgoldenrod',
    'Mobile': 'deepskyblue',
    'Tablet': 'navy'
}
pio.templates.default = "simple_white"
device_group= df.groupby("Device_Type")["Total_Pages_Viewed"].mean().reset_index()
device_group.columns = ['Device_Type', 'Average_Total_Pages_Viewed']
fig = px.bar(device_group, x='Device_Type', y='Average_Total_Pages_Viewed', color='Device_Type', color_discrete_map=custom_colors,
             title='Average Total Pages Viewed on Device')
fig.show()
```



```
In [7]: # Calculate Customer Lifetime Value

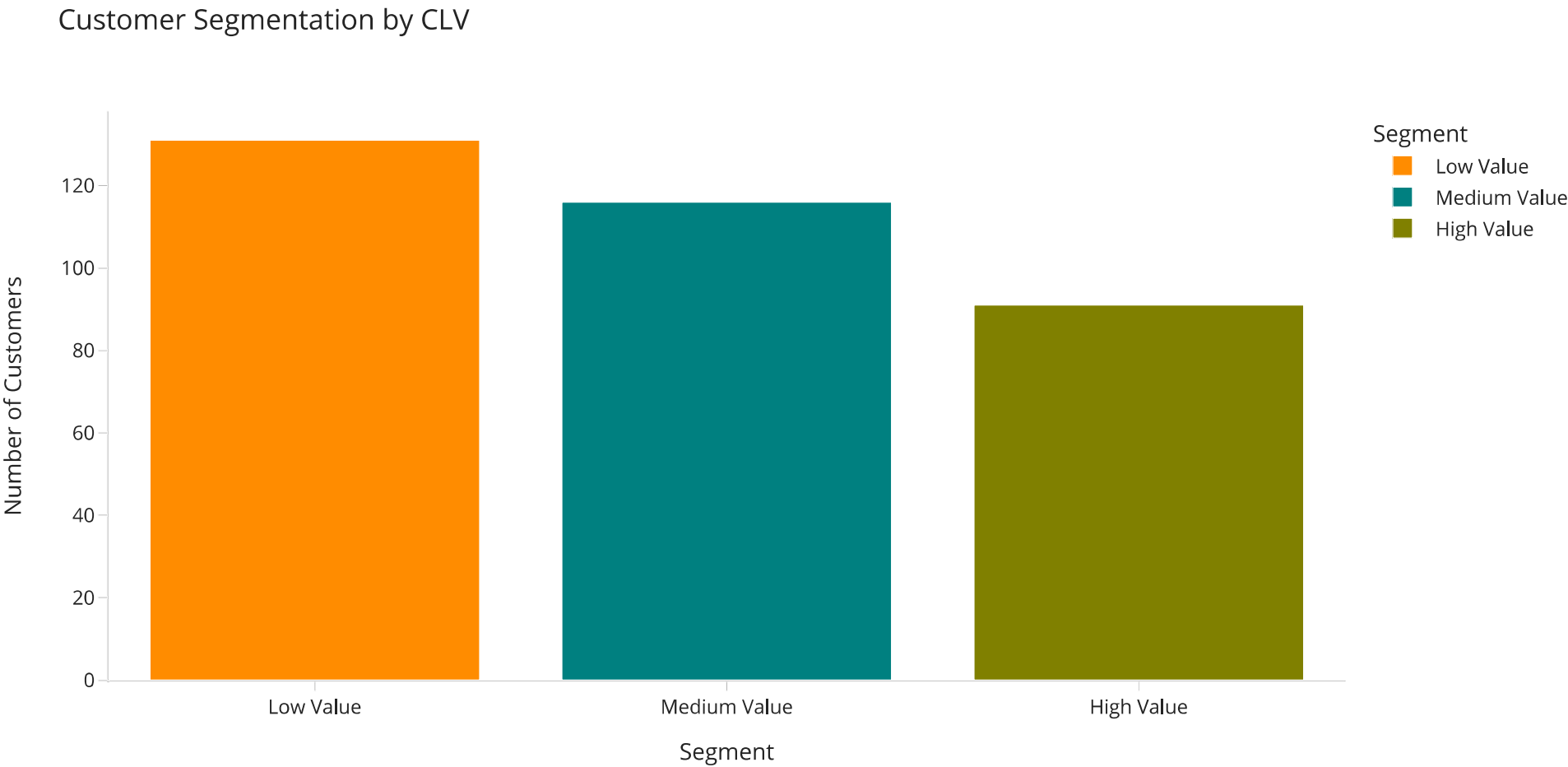
df['CLV'] = (df['Total_Purchases'] * df['Total_Pages_Viewed']) / df['Age']
df['Segment'] = pd.cut(df['CLV'], bins=[1, 2.5, 5, float('inf')],
                        labels=['Low Value', 'Medium Value', 'High Value'])

segment_counts = df['Segment'].value_counts().reset_index()
segment_counts.columns = ['Segment', 'Count']

# Visualize Customer Lifetime Value

custom_colors = {
    'Low Value': 'darkorange',
    'Medium Value': 'teal',
    'High Value': 'olive'
}
pio.templates.default = "simple_white"
fig = px.bar(segment_counts, x='Segment', y='Count', color='Segment', color_discrete_map=custom_colors,
              title='Customer Segmentation by CLV')
fig.update_xaxes(title='Segment')
fig.update_yaxes(title='Number of Customers')

fig.show()
```

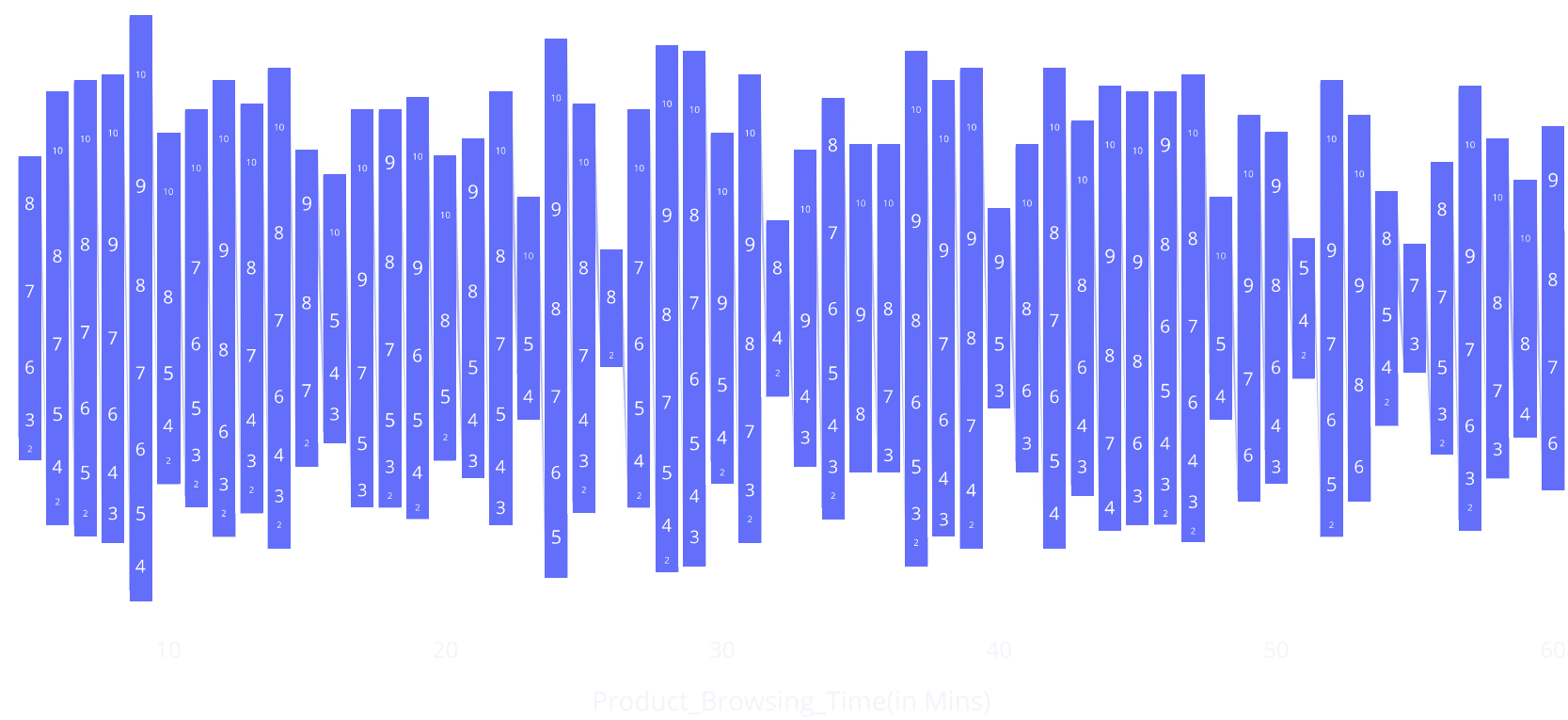


```
In [8]: # Conversion Funnel

pio.templates.default = "plotly_dark"
funnel = df[['Product_Browsing_Time(in Mins)', 'Items_Added_to_Cart', 'Total_Purchases']]
funnel = funnel.groupby(['Product_Browsing_Time(in Mins)', 'Items_Added_to_Cart']).sum().reset_index()

fig = px.funnel(funnel, x='Product_Browsing_Time(in Mins)', y='Items_Added_to_Cart', title='Conversion Funnel')
fig.show()
```

Conversion Funnel



In the depicted graph, the horizontal axis denotes the duration customers allocate to exploring products on the e-commerce platform. Conversely, the vertical axis illustrates the count of items customers include in their shopping carts throughout their browsing sessions.

```
In [9]: # Churn Rate

df['Churned'] = df['Total_Purchases'] == 0

churn_rate = df['Churned'].mean()
print(churn_rate)
```

0.198

A churn rate of 0.198 signifies a substantial proportion of customers who have churned. It is imperative to address this churn to sustain business growth and profitability.

# Conclusion



Customer Behavior Analysis entails scrutinizing and comprehending the interactions between customers and a business, product, or service.It aids organizations in making informed decisions, refining their strategies, and improving customer experiences.

In [ ]: