FRAMEWORK FOR DATA VISUALIZATION AND ANALYTICS

MINI PROJECT

EDA ON FIFA WOMEN PLAYERS DATASET

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AIM:

To perform exploratory data visualization on the FIFA dataset using Python (Matplotlib, Seaborn, Plotly), Power BI, and Tableau, and compare their visualization capabilities.

OBJECTIVES:

- Load and analyze the FIFA player dataset.
- Perform data cleaning and transformation.
- Create visualizations using Python.
- Build dashboards in Power BI and Tableau.
- Interpret insights from all tools.

DATASET DESCRIPTION:

Dataset Name: FIFA Data for EDA and Stats (Kaggle)
Source: https://www.kaggle.com/datasets/mukeshmanral/fifa-data-for-eda-and-stats

Attribute	Description
Name	Player name
Age	Player age
Nationality	Country of origin
Overall	Overall rating
Potential	Potential rating
Club	Team/Club name
Value	Market value in Euros
Wage	Player weekly wage
Position	Playing position
Work Rate	Player work intensity
Preferred Foot	Right or Left foot

TOOLS USED:

- **Python Libraries:** Pandas, Matplotlib, Seaborn, Plotly, NumPy
- **Data Visualization Tools:** Power BI, Tableau

Python Implementation :

CODE:

```
!pip install kagglehub pandas matplotlib seaborn plotly --quiet

import kagglehub
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
import numpy as np
import os

sns.set_style("whitegrid")

dataset_dir = kagglehub.dataset_download("mukeshmanral/fifa-data-for-eda-and-stats")
print("Dataset downloaded to:", dataset_dir)

files = os.listdir(dataset_dir)
csv_file = os.path.join(dataset_dir, files[0])
df = pd.read_csv(csv_file)

def convert_value(x):
    if isinstance(x, str):
        x = x.replace('€','').replace('K','000').replace('M','000000')
        return float(x)
    return x

for col in ['Value','Wage']:
    if col in df.columns:
        df[col] = df[col].apply(convert_value)



plt.figure(figsize=(10,5))
top_players = df[['Name', 'Overall']].sort_values(by='Overall', ascending=False).head(10)
sns.barplot(x='Overall', y='Name', data=top_players, palette="viridis")
plt.title("Top 10 Players: Comparing Overall Ratings", fontsize=14)
plt.xlabel("Overall Rating")
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plt.ylabel("Player Name")
plt.show()

plt.figure(figsize=(10,5))
sns.histplot(df['Age'], bins=20, kde=True, color='skyblue')
plt.title("Player Age Distribution", fontsize=14)
plt.xlabel("Age")
plt.ylabel("Number of Players")
plt.show()

plt.figure(figsize=(12,6))
sns.boxplot(x='Position', y='Overall', data=df, palette="Set2")
plt.xticks(rotation=45)
plt.title("Overall Rating by Position", fontsize=14)
plt.xlabel("Position")
plt.ylabel("Overall Rating")
plt.show()

plt.figure(figsize=(10,5))
sns.scatterplot(x='Overall', y='Potential', data=df, hue='Age', palette='coolwarm',
alpha=0.7)
plt.title("Overall vs Potential by Age", fontsize=14)
plt.xlabel("Overall Rating")
plt.ylabel("Potential Rating")
plt.legend(title='Age', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()

plt.figure(figsize=(12,10))
corr = df.select_dtypes(include='number').corr()
mask = np.triu(np.ones_like(corr, dtype=bool))
sns.heatmap(corr, mask=mask, annot=False, cmap="coolwarm", linewidths=0.5,
cbar_kws={"shrink": 0.8}, square=True)
plt.title("Correlation Matrix: Relationships Between Numeric Attributes", fontsize=14)
plt.show()

plt.figure(figsize=(12,6))
top_nationalities = df['Nationality'].value_counts().head(15)
sns.barplot(x=top_nationalities.values, y=top_nationalities.index, palette="magma")
plt.title("Top 15 Nationalities: Player Count Comparison", fontsize=14)
plt.xlabel("Number of Players")
plt.ylabel("Nationality")
plt.show()

if 'Preferred Foot' in df.columns:
```

```
    foot_counts = df['Preferred Foot'].value_counts()
    plt.figure(figsize=(6,6))
    plt.pie(foot_counts, labels=foot_counts.index, autopct='%1.1f%%',
colors=['#ff9999','#66b3ff'], startangle=90)
    plt.title("Preferred Foot Distribution", fontsize=14)
    plt.show()

avg_overall_age = df.groupby('Age')['Overall'].mean().reset_index()
plt.figure(figsize=(10,5))
sns.lineplot(x='Age', y='Overall', data=avg_overall_age, marker='o', color='darkgreen')
plt.title("Average Overall Rating by Age", fontsize=14)
plt.xlabel("Age")
plt.ylabel("Average Overall")
plt.show()

plt.figure(figsize=(10,5))
sns.kdeplot(df['Potential'], fill=True, color='green')
plt.title("Distribution of Player Potential", fontsize=14)
plt.xlabel("Potential")
plt.ylabel("Density")
plt.show()

plt.figure(figsize=(12,6))
sns.stripplot(x='Position', y='Overall', data=df, size=3, jitter=True, palette="Set3")
plt.xticks(rotation=45)
plt.title("Overall Rating by Position (Strip Plot)", fontsize=14)
plt.xlabel("Position")
plt.ylabel("Overall Rating")
plt.show()

if 'Work Rate' in df.columns:
    plt.figure(figsize=(12,6))
    sns.violinplot(x='Work Rate', y='Overall', data=df, palette="Pastel1")
    plt.xticks(rotation=45)
    plt.title("Overall Rating by Work Rate", fontsize=14)
    plt.xlabel("Work Rate")
    plt.ylabel("Overall Rating")
    plt.show()

from pandas.plotting import scatter_matrix
numeric_cols = df.select_dtypes(include='number').columns.tolist()
scatter_matrix(df[numeric_cols], figsize=(15,15), diagonal='kde', color='purple')
plt.suptitle("Scatter Matrix: Comparing Key Numeric Metrics", fontsize=16)
plt.show()
```

```
if 'Club' in df.columns:
    top_clubs = df['Club'].value_counts().head(10)
    plt.figure(figsize=(10,5))
    sns.barplot(x=top_clubs.values, y=top_clubs.index, palette='coolwarm')
    plt.title("Top 10 Clubs by Number of Players", fontsize=14)
    plt.xlabel("Number of Players")
    plt.ylabel("Club")
    plt.show()

if 'Nationality' in df.columns and 'Club' in df.columns:
    sunburst_df = df.groupby(['Nationality','Club']).size().reset_index(name='PlayerCount')
    fig = px.sunburst(sunburst_df, path=['Nationality','Club'], values='PlayerCount',
                      color='PlayerCount', color_continuous_scale='RdBu',
hover_data=['PlayerCount'])
    fig.update_traces(textinfo='label')
    fig.update_layout(title="Players by Nationality and Club (Clean View)")
    fig.show()

fig = px.scatter(df, x='Age', y='Overall', size='Potential', color='Nationality',
hover_name='Name',
                 size_max=60, opacity=0.6)
fig.update_layout(title="Age vs Overall with Potential as Bubble Size")
fig.show()
```

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Pythonoutput:

Power bi output:

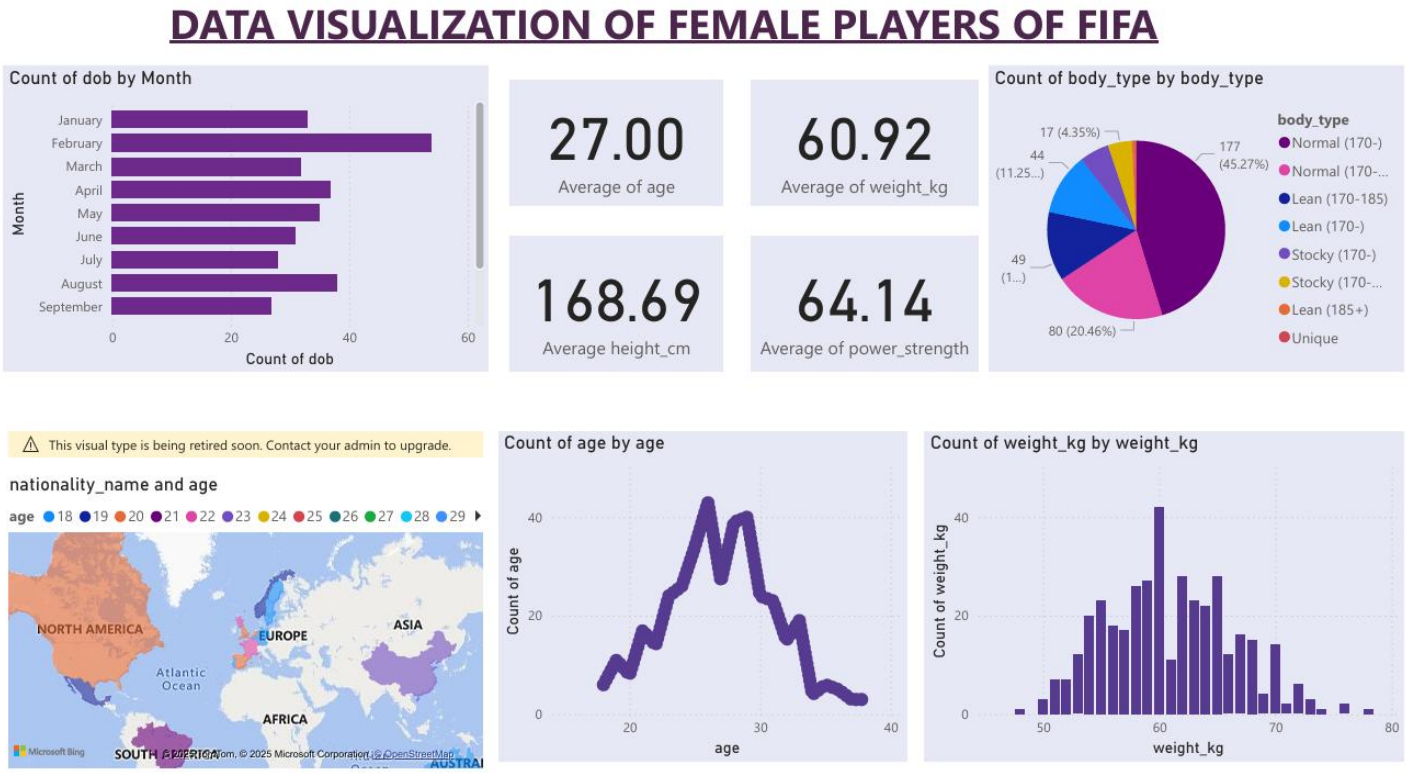

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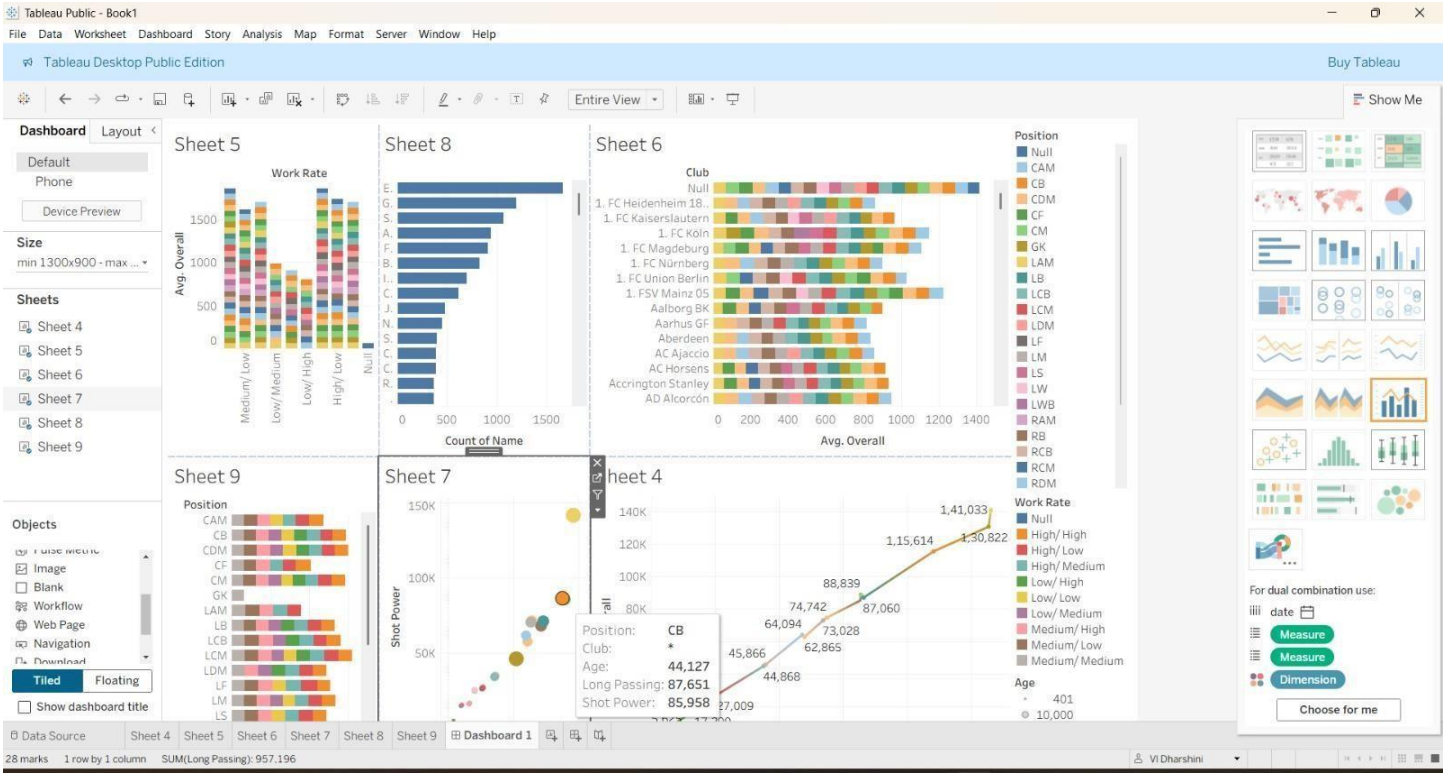
Tableau ouput:



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Comparison Between Visualization Tools

Feature	Python	Power BI	Tableau
Customizatio n	High	Medium	High
Interactivity	Moderate	Very High	Very High
Ease of Use	Medium	Easy	Easy
Suitable For	Analysts	Business Users	Analysts C Managers

Conclusion

- Python allows flexible and detailed control over visuals.
- Power BI and Tableau offer interactive and dynamic dashboards.
- Combining all three gives complete analytical and visual coverage.