Féidearthachtaí as Cuimse
Infinite Possibilities

Programming for Analytics

Lecture 10: Advanced Visualisation

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Overview

- What is Seaborn?
- Common Plots
- New Plots
- Grids
- Styles and Themes

What is Seaborn?

- High-level statistical visualisation
- Works well with pandas DataFrames
- Built on top of Matplotlib

Importing Required Libraries

```
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd
import numpy and np
```

Load the Malazan Visualisation Dataset

```
df = pd.read_csv('malazan_visualisation_dataset.csv')
df.head()
```

Set a Theme

```
sns.set_theme(style='darkgrid')
```

Themes: darkgrid, whitegrid, dark, white, ticks

Scatterplot Example

```
sns.scatterplot(data=df,
x='Combat_Skill',
y='Power_Level')
plt.show()
```

Activity: Commander Power vs Magic

- Plot `Combat_Skill` vs `Arcane_Mastery`
- Colour by Army

Histogram Example

```
sns.histplot(df['Magic_Aptitude'], kde=True)
plt.show()
```

KDE Plot

- kernel density estimate
- represents the data using a continuous probability density curve in one or more dimensions.
- Relative to a histogram, KDE can produce a plot that is less cluttered and more interpretable, especially when drawing multiple distributions.

KDE Example

```
sns.kdeplot(df['Morale'],
shade=True)
plt.show()
```

Activity: Morale Analysis

- Plot morale distribution
- Identify high-morale commanders

Boxplot Example

```
sns.boxplot(data=df, x='Army',
y='Combat_Skill')
```

Activity: Combat Skill by Army

- Which army produces the strongest fighters?
- What is the variance of combat skills throughout all armies?
- Answer those questions with boxplots!

Heatmap Example

```
sns.heatmap(df.corr(),
annot=True, cmap='coolwarm')
```

Activity: Correlations

- Identify the strongest correlations
- Explain unusual patterns

Pairplot Example

```
sns.pairplot(df)
plt.show()
```

Activity: Pairplot Analysis

- Find clusters or outliers

Violin Plot Example

```
sns.violinplot(data=df,
x='Army', y='Magic_Aptitude')
```

Activity: Army Variability

- Which army has highest power level spread?

Joinplot Example

```
sns.jointplot(data=df,
x='Arcane_Mastery',
y='Strategic_Intellect',
kind='hex')
```

Activity: Strategy vs Magic

- Are high mages good strategists?

FacetGrid Example

```
g = sns.FacetGrid(df,
col='Army’)
g.map(sns.histplot,
'Close_Combat')
```

Activity: Army Histograms

- Which army fights best in melée?

Clustermap Example

```
sns.clustermap(df.corr(),
cmap='viridis', annot=True)
```

Activity: Cluster Interpretation

- Which stats cluster together?

Styles and Themes

```
sns.set_style('whitegrid')
sns.set_palette('inferno')
```

Activity: Re-style a Chart

- Recreate a plot with a new palette
- Explain benefits

Complex Overlay Example

```
sns.boxplot(...)
sns.swarmplot(...)
```

- Use swarmplot to show outliers

Activity: Outlier Detection

- Identify extreme commanders

Commander Dashboard Example

- Plot scatter, heatmap, violin, facegrid
- Tell a story about commander strengths

Workflow

- Load data
- Explore
- Plot
- Interpret

Final Questions

- Which commanders are strongest overall?
- Which armies dominate different attributes?

Questions?