In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [6]:
```
apps_df = pd.read_csv("apps.csv")
apps_df.head()
```

Out[6]:

	Unnamed: 0	App	Category	Rating	Reviews	Size	Installs	Type	Pric
0	0	Photo Editor & Candy Camera & Grid & ScrapBook	ART_AND_DESIGN	4.1	159	19.0	10,000+	Free	
1	1	Coloring book moana	ART_AND_DESIGN	3.9	967	14.0	500,000+	Free	
2	2	U Launcher Lite – FREE Live Cool Themes, Hide ...	ART_AND_DESIGN	4.7	87510	8.7	5,000,000+	Free	
3	3	Sketch - Draw & Paint	ART_AND_DESIGN	4.5	215644	25.0	50,000,000+	Free	
4	4	Pixel Draw - Number Art Coloring Book	ART_AND_DESIGN	4.3	967	2.8	100,000+	Free	

In [7]:
```
reviews_df = pd.read_csv("user_reviews.csv")
reviews_df.head()
```

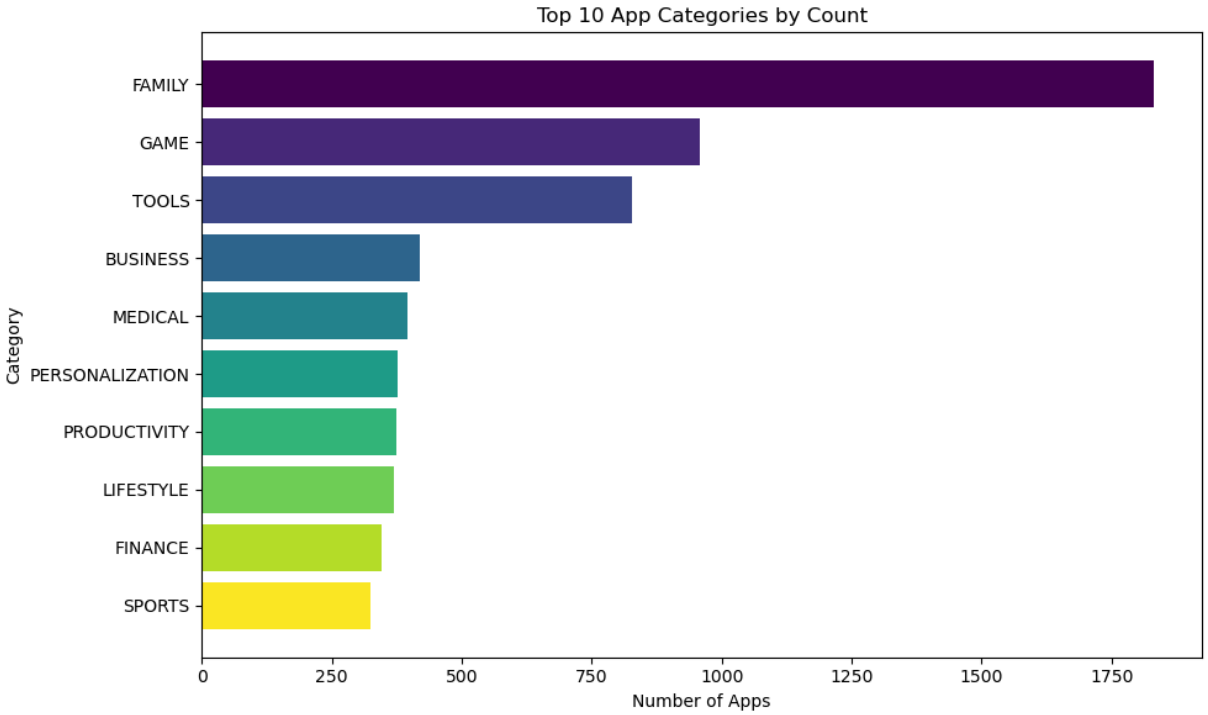
Out[7]:

	App	Translated_Review	Sentiment	Sentiment_Polarity	Sentiment_Subjectivity
0	10 Best Foods for You	I like eat delicious food. That's I'm cooking ...	Positive	1.00	0.533333
1	10 Best Foods for You	This help eating healthy exercise regular basis	Positive	0.25	0.288462
2	10 Best Foods for You	NaN	NaN	NaN	NaN
3	10 Best Foods for You	Works great especially going grocery store	Positive	0.40	0.875000
4	10 Best Foods for You	Best idea us	Positive	1.00	0.300000

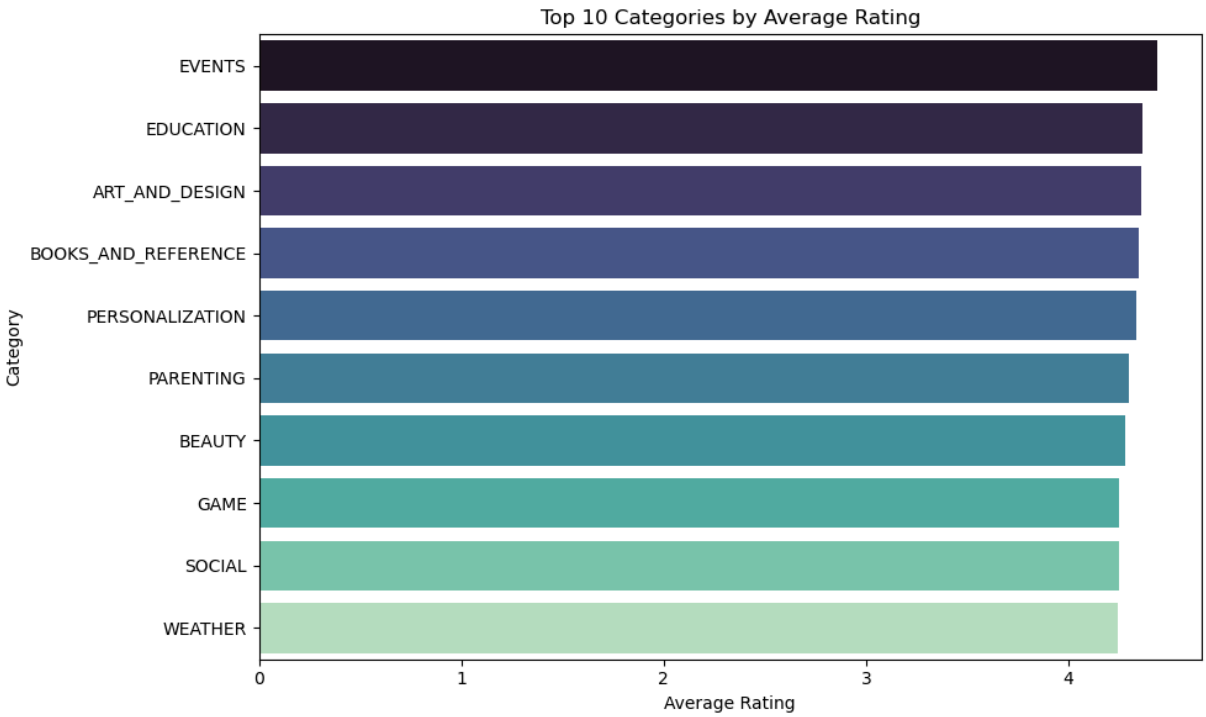
In [8]:
```
apps_df.drop(columns=["Unnamed: 0"], inplace=True)
```

In [13]:
```
apps_df["Installs"] = apps_df["Installs"].astype(str).str.replace("+", "", regex=Fa

apps_df["Price"] = apps_df["Price"].astype(str).str.replace("$", "", regex=False).a
```

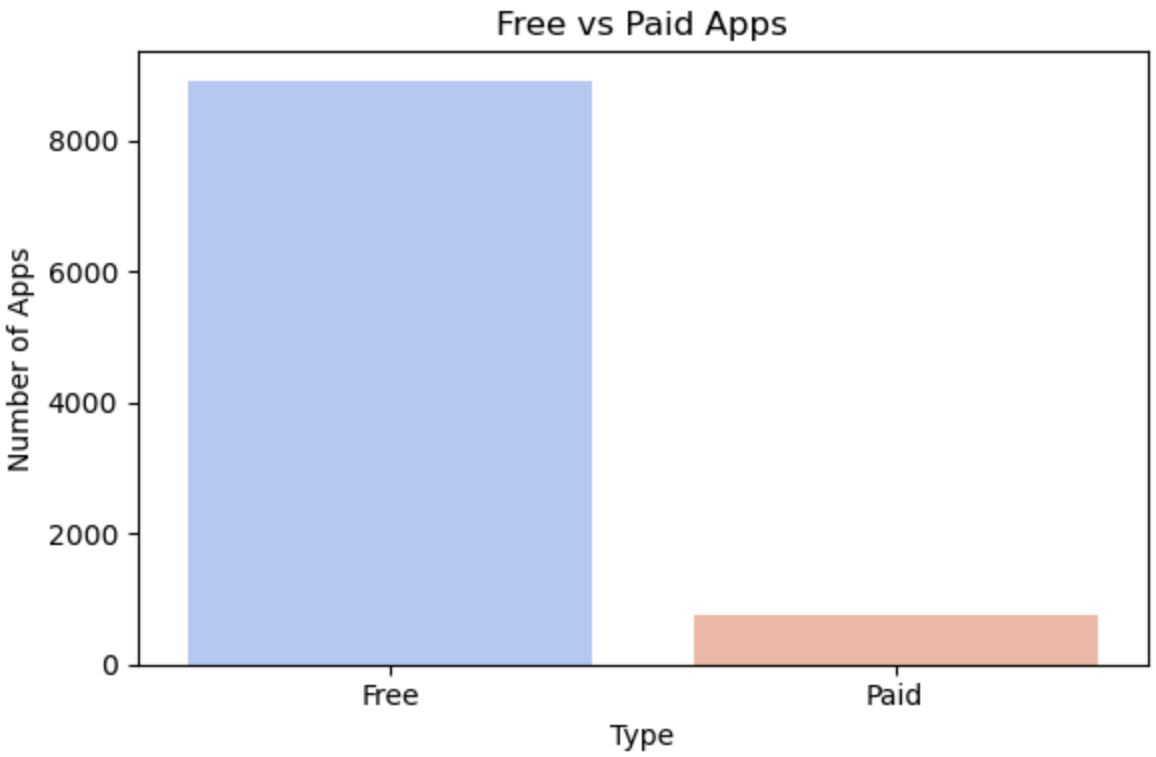
In [21]:
```
# Prepare data
category_counts = apps_df["Category"].value_counts().head(10)
category_df = category_counts.reset_index()
category_df.columns = ["Category", "Count"]

import matplotlib.pyplot as plt
import numpy as np

# Build a color list from a colormap
colors = plt.cm.viridis(np.linspace(0, 1, len(category_df)))

plt.figure(figsize=(10, 6))
plt.barh(
    y=category_df["Category"],
    width=category_df["Count"],
    color=colors
)
plt.title("Top 10 App Categories by Count")
plt.xlabel("Number of Apps")
plt.ylabel("Category")
plt.gca().invert_yaxis()  # Largest on top (optional)
plt.tight_layout()
plt.show()
```



In [24]:
```
rating_by_category = apps_df.groupby("Category")["Rating"].mean().sort_values(ascen

rating_df = rating_by_category.reset_index()
rating_df.columns = ["Category", "Average Rating"]

plt.figure(figsize=(10, 6))
sns.barplot(
    data=rating_df,
    x="Average Rating",
    y="Category",
    hue="Category",
    palette="mako",
    dodge=False,
    legend=False
)
plt.title("Top 10 Categories by Average Rating")
plt.xlabel("Average Rating")
plt.ylabel("Category")
plt.tight_layout()
plt.show()
```

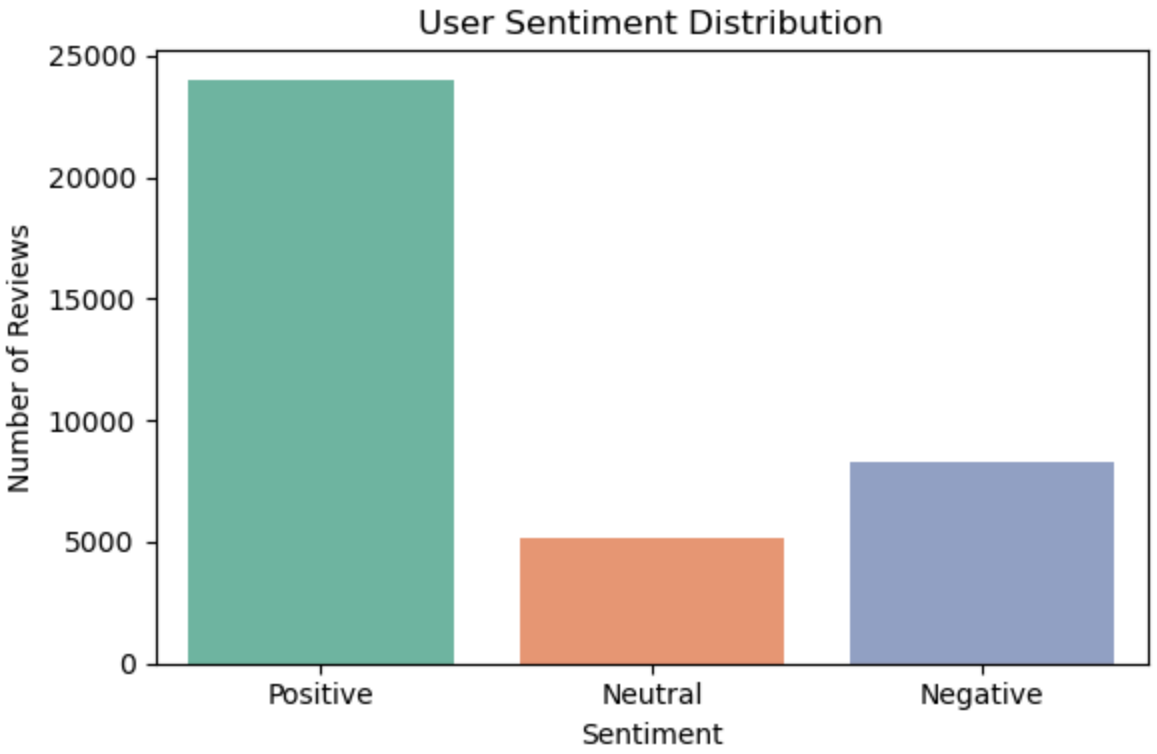


In [26]:
```
type_counts = apps_df["Type"].value_counts()
type_df = type_counts.reset_index()
type_df.columns = ["Type", "Count"]

import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(6, 4))
sns.barplot(
    data=type_df,
    x="Type",
    y="Count",
    hue="Type",
    palette="coolwarm",
    dodge=False,
    legend=False
)
plt.title("Free vs Paid Apps")
plt.xlabel("Type")
plt.ylabel("Number of Apps")
plt.tight_layout()
plt.show()
```



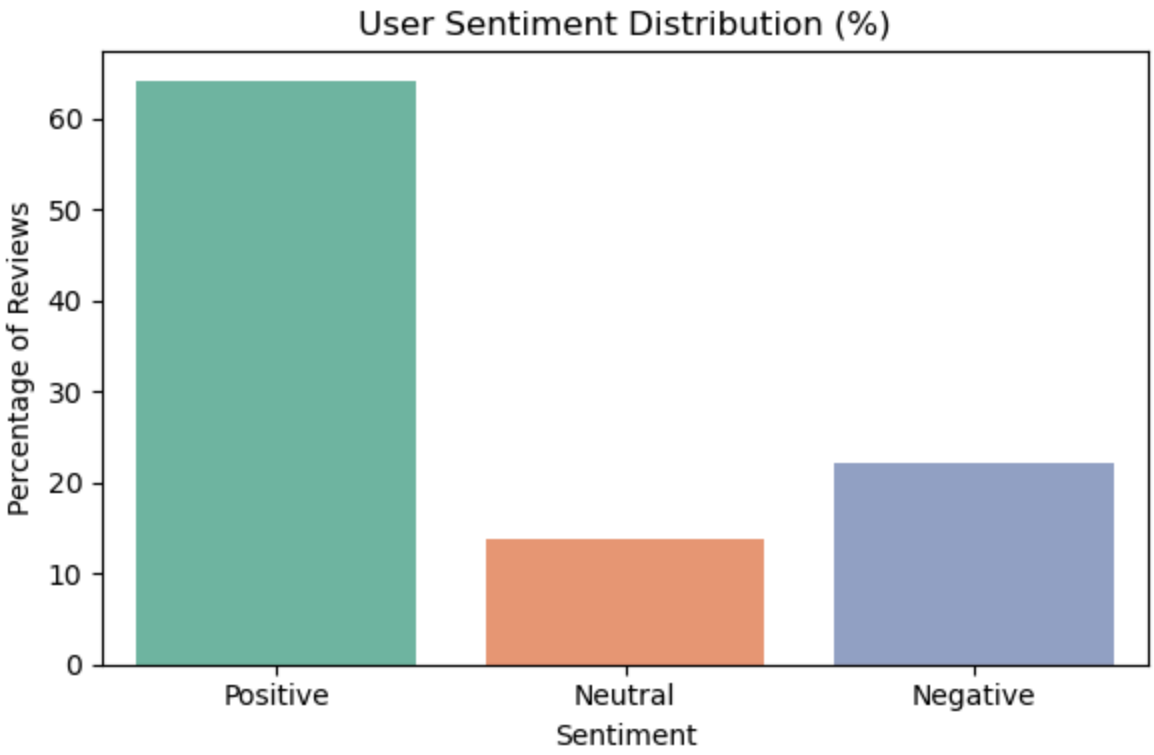
In [32]:
```python
# Standardize sentiment labels
sentiment_map = {
    "Positive": "Positive",
    "Neutral": "Neutral",
    "Negative": "Negative"
}

# Create a proper copy and assign with .loc to avoid SettingWithCopyWarning
clean_reviews = reviews_df.dropna(subset=["Sentiment"]).copy()
clean_reviews.loc[:, "Sentiment"] = clean_reviews["Sentiment"].map(sentiment_map)

# Custom order
order = ["Positive", "Neutral", "Negative"]

# Plot
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(6, 4))
sns.countplot(
    data=clean_reviews,
    x="Sentiment",
    order=order,
    hue="Sentiment",
    palette="Set2",
    dodge=False,
    legend=False
)
plt.title("User Sentiment Distribution")
plt.xlabel("Sentiment")
plt.ylabel("Number of Reviews")
```

```
plt.tight_layout()
plt.show()
```



In [33]:
```
sentiment_map = {
    "Positive": "Positive",
    "Neutral": "Neutral",
    "Negative": "Negative",
    "Negative Sentiment": "Negative"
}
```

In [34]:
```
pct = (clean_reviews["Sentiment"].value_counts(normalize=True)
       .reindex(order).mul(100))
plt.figure(figsize=(6, 4))
sns.barplot(x=pct.index, y=pct.values, hue=pct.index, palette="Set2", dodge=False,
plt.title("User Sentiment Distribution (%)")
plt.xlabel("Sentiment")
plt.ylabel("Percentage of Reviews")
plt.tight_layout()
plt.show()
```


User Sentiment Distribution (%)
Percentage of Reviews
0
10
20
30
40
50
60
Positive
Neutral
Negative
Sentiment