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# %%
import pandas as pd
import matplotlib.pyplot as plt
# Load the Data
data = pd.read_csv('hospital_cleaned.csv')
h = pd.DataFrame(data)
print(h)

# %%
h['DischargeDate'] = pd.to_datetime(h['DischargeDate'], errors='coerce')
h['AdmissionDate'] = pd.to_datetime(h['AdmissionDate'], errors='coerce')

print(h)

# %%
h.to_csv('hospital_cleaned.csv', index=False)

# %%
print(h.dtypes)

# %%
#Visualize the number of patients per department using a bar chart.
# Create bar chart
department_counts = h["Department"].value_counts()

# Create bar chart
plt.figure(figsize=(10, 6))
plt.bar(department_counts.index, department_counts.values, color='skyblue')

# Labels and title
plt.xlabel("Department")
plt.ylabel("Number of Patients")
plt.title("Number of Patients per Department")

# Show the chart
plt.show()

# %%
#Create a pie chart showing the distribution of patient statuses (Admitted, Discharged, Under Observation).
# Count the number of patients per status
status_counts = h["Status"].value_counts()

# Create pie chart
plt.figure(figsize=(8, 8))
plt.pie(status_counts.values, labels=status_counts.index, autopct="%1.1f%%", colors=["lightblue", "lightgreen", "salmon"])

# Title
plt.title("Distribution of Patient Statuses")

# Show the chart
plt.show()

# %%
#Generate a line chart showing monthly hospital admissions trends.
# Convert the admission date column to datetime format
h["AdmissionDate"] = pd.to_datetime(h["AdmissionDate"], errors="coerce")

# Extract the month and count admissions per month
monthly_admissions = h["AdmissionDate"].dt.to_period("M").value_counts().sort_index()

# Create line chart
plt.figure(figsize=(10, 6))
plt.plot(monthly_admissions.index.astype(str), monthly_admissions.values, marker='o', linestyle='-', color='b')

# Labels and title
plt.xlabel("Month")
plt.ylabel("Number of Admissions")
plt.title("Monthly Hospital Admissions Trends")
plt.xticks(rotation=45) # Rotate labels for better readability

# Show the chart
plt.show()

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