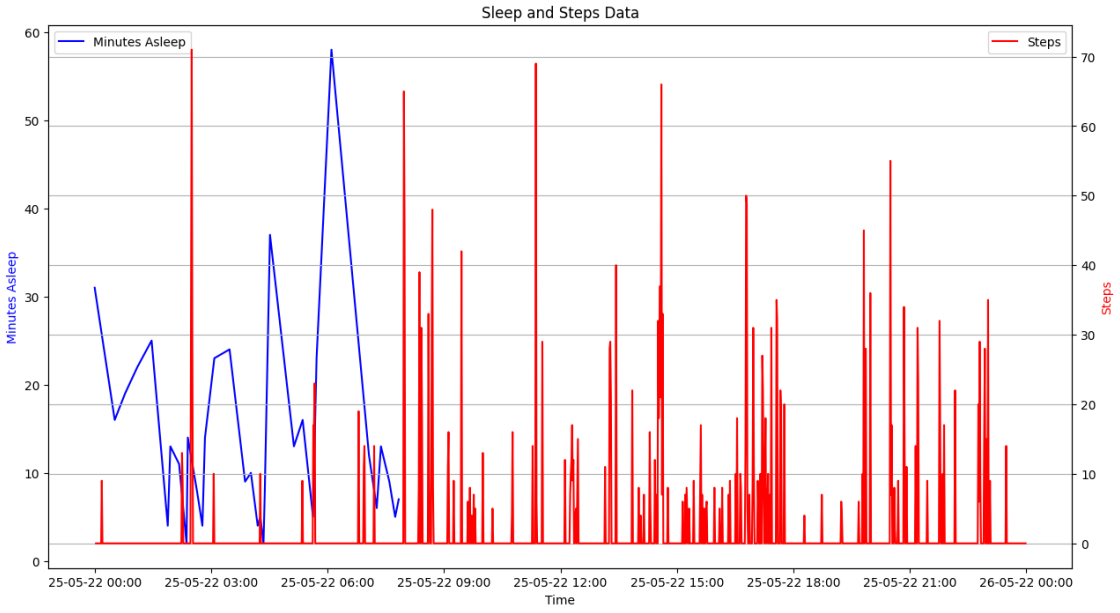
sleep-step

July 31, 2024

[16]:
```
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib.dates as mdates

# Load the sleep and steps data
sleep_df = pd.read_csv('sleep.csv')
steps_df = pd.read_csv('steps.csv')

# Preprocess the sleep data
sleep_df['Timestamp'] = pd.to_datetime(sleep_df['Timestamp'])
sleep_df = sleep_df.sort_values('Timestamp').reset_index(drop=True)

# Preprocess the steps data
steps_df['datetime'] = pd.to_datetime(steps_df['datetime'], format='%d/%m/%y %H:
 ↪%M')
steps_df = steps_df.sort_values('datetime').reset_index(drop=True)

# Calculate total sleep time
total_sleep_time = sleep_df['Minutes Asleep'].sum()

# Identify sleep interruptions
sleep_df['time_diff'] = sleep_df['Timestamp'].diff().dt.total_seconds().div(60).
 ↪fillna(0)
sleep_df['interruption'] = (sleep_df['time_diff'] > sleep_df['Minutes Asleep']␣
 ↪* 1.5)

# Calculate the number of interruptions
num_interruptions = sleep_df['interruption'].sum()

# Calculate sleep quality score
sleep_quality = (total_sleep_time - num_interruptions * 10) / total_sleep_time␣
 ↪* 100

# Plot the sleep and steps data
fig, ax = plt.subplots(figsize=(15, 8))

# Plot sleep data
```

```
ax.plot(sleep_df['Timestamp'], sleep_df['Minutes Asleep'], label='Minutes␣
 ↪Asleep', color='blue')

# Plot steps data
ax2 = ax.twinx()
ax2.plot(steps_df['datetime'], steps_df['steps'], label='Steps', color='red')

# Format the x-axis to display date and time
xfmt = mdates.DateFormatter('%d-%m-%y %H:%M')
ax.xaxis.set_major_formatter(xfmt)

# Add labels and legend
ax.set_xlabel('Time')
ax.set_ylabel('Minutes Asleep', color='blue')
ax2.set_ylabel('Steps', color='red')
ax.legend(loc='upper left')
ax2.legend(loc='upper right')

plt.title('Sleep and Steps Data')
plt.grid()
plt.savefig('sleep.png')  # You can specify the format (e.g., 'line_chart.png',␣
 ↪'line_chart.jpg', etc.)
plt.show()

# Display results
print(f'Total Sleep Time: {total_sleep_time} minutes')
print(f'Number of Interruptions: {num_interruptions}')
print(f'Sleep Quality: {sleep_quality:.2f}%')
```



```
Total Sleep Time: 472 minutes
Number of Interruptions: 13
Sleep Quality: 72.46%
```

0.0.1 Sleep Time:

- **Total Sleep Time:** 472 minutes, which translates to approximately 7 hours and 52 minutes.
- The sleep data shows fluctuations in sleep duration throughout the 24-hour period.

0.0.2 Number of Interruptions:

- **Number of Interruptions:** 13 interruptions, indicating the number of times your sleep was disrupted.
- These interruptions are spread out, with some occurring in the early hours and others later in the day.

0.0.3 Sleep Quality:

- **Sleep Quality:** 72.46%, suggesting a moderately good quality of sleep. This metric takes into account the total sleep time and the number of interruptions.

0.0.4 Steps:

- The red line represents steps taken throughout the day.
- There are peaks of activity throughout the day, indicating periods of walking or other physical activity.
- The step data is more dispersed during waking hours and shows minimal activity during typical sleep hours.

0.0.5 Summary:

Overall, you had a total of almost 8 hours of sleep with 13 interruptions, resulting in a sleep quality of around 72.46%. Your physical activity shows periods of walking or movement throughout the day, with expected inactivity during sleep periods. This suggests a generally active lifestyle but with room for improving sleep quality by possibly reducing the number of interruptions.