In [24]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Load the dataset
file_path = 'C:\\Users\\melha\\Downloads\\updated-hosital-data.csv'
data = pd.read_csv(file_path)

# Print the first few rows of the dataset to verify loading
print(data.head())
```

```
                 date   patient_id patient_gender  patient_age  \
0  2020-03-20 08:47:01  145-39-5406              M           69
1  2020-06-15 11:29:36  316-34-3057              M            4
2  2020-06-20 09:13:13  897-46-3852              F           56
3  2020-02-04 22:34:29  358-31-9711              F           24
4  2020-09-04 17:48:27  289-26-0537              M            5

   patient_sat_score patient_first_inital patient_last_name  \
0               10.0                   H         Glasspool
1                NaN                   X           Methuen
2                9.0                   P         Schubuser
3                8.0                   U          Titcombe
4                NaN                   Y       Gionettitti

                   patient_race  patient_admin_flag  patient_waittime  \
0                         White               False                39
1  Native American/Alaska Native                True                27
2              African American                True                55
3  Native American/Alaska Native                True                31
4              African American               False                10

  department_referral  Surgery Duration
0                 NaN               132
1                 NaN               122
2    General Practice                44
3    General Practice               136
4         Orthopedics               101
```

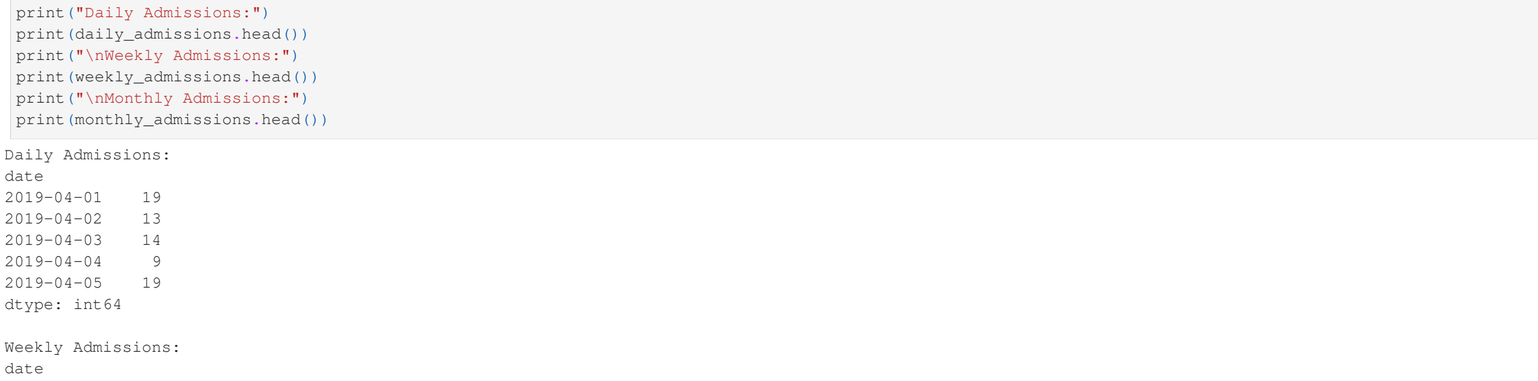
In [26]:
```
# Format the date columns using pd.to_datetime() for accurate time-series analysis
data['date'] = pd.to_datetime(data['date'])
```

In [28]:
```
# Group admission data by day, week, and month
daily_admissions = data.groupby(data['date'].dt.date).size()
weekly_admissions = data.groupby(data['date'].dt.to_period('W')).size()
monthly_admissions = data.groupby(data['date'].dt.to_period('M')).size()

# Print the grouped data to verify
print("Daily Admissions:")
print(daily_admissions.head())
print("\nWeekly Admissions:")
print(weekly_admissions.head())
print("\nMonthly Admissions:")
print(monthly_admissions.head())
```

```
Daily Admissions:
date
2019-04-01    19
2019-04-02    13
2019-04-03    14
2019-04-04     9
2019-04-05    19
dtype: int64

Weekly Admissions:
date
2019-04-01/2019-04-07     99
2019-04-08/2019-04-14    128
2019-04-15/2019-04-21    114
2019-04-22/2019-04-28    110
2019-04-29/2019-05-05    118
Freq: W-SUN, dtype: int64

Monthly Admissions:
date
2019-04    479
2019-05    480
2019-06    506
2019-07    464
2019-08    494
Freq: M, dtype: int64
```

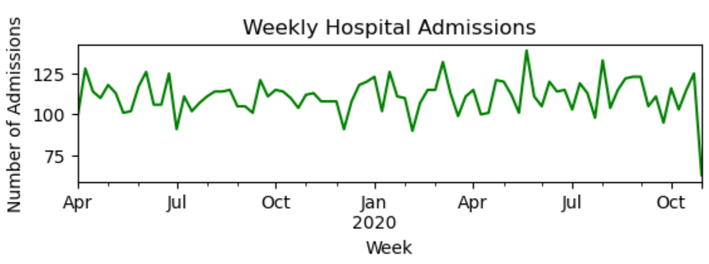
In [34]:
```
plt.figure(figsize=(15, 10))

# Daily admissions line plot
plt.subplot(3, 1, 1)
daily_admissions.plot(kind='line', color='blue')
plt.title('Daily Hospital Admissions')
plt.xlabel('Date')
plt.ylabel('Number of Admissions')
```

Out[34]: Text(0, 0.5, 'Number of Admissions')

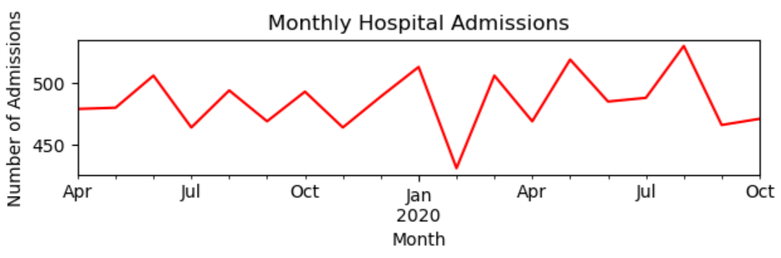


In [44]:
```
# Weekly admissions line plot
plt.subplot(3, 1, 2)
weekly_admissions.plot(kind='line', color='green')
plt.title('Weekly Hospital Admissions')
plt.xlabel('Week')
plt.ylabel('Number of Admissions')
```

Out[44]: Text(0, 0.5, 'Number of Admissions')



In [38]:
```
# Monthly admissions line plot
plt.subplot(3, 1, 3)
monthly_admissions.plot(kind='line', color='red')
plt.title('Monthly Hospital Admissions')
plt.xlabel('Month')
plt.ylabel('Number of Admissions')

plt.tight_layout()
plt.savefig("admission_trends.png")
plt.show()
```



In [32]:
```
# Analyze and report on seasonal patterns and peak admission periods
peak_daily_admission = daily_admissions.idxmax(), daily_admissions.max()
peak_weekly_admission = weekly_admissions.idxmax(), weekly_admissions.max()
peak_monthly_admission = monthly_admissions.idxmax(), monthly_admissions.max()

print("Admission Trends Analysis:")
print(f"Peak Daily Admission: {peak_daily_admission}")
print(f"Peak Weekly Admission: {peak_weekly_admission}")
print(f"Peak Monthly Admission: {peak_monthly_admission}")
```

```
Admission Trends Analysis:
Peak Daily Admission: (datetime.date(2019, 4, 12), 30)
Peak Weekly Admission: (Period('2020-05-18/2020-05-24', 'W-SUN'), 139)
Peak Monthly Admission: (Period('2020-08', 'M'), 530)
```