```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error
import matplotlib.pyplot as plt
```

```
# Load data into DataFrame
df = pd.read_csv("database.txt", sep=',', header=None, names=['pitch', 'roll', 'yaw', 'timestamp'])
df.head()
```

	pitch	roll	yaw	timestamp
0	0.000000	0.000000	0.00000	15:57:12:945
1	-52.654250	-1.685466	-135.39719	15:57:13:166
2	-52.369420	-1.668458	-135.14746	15:57:13:271
3	-53.019505	-1.029275	-135.96890	15:57:13:323
4	-52.985058	-0.911930	-136.09015	15:57:13:402

Next steps: Generate code with df View recommended plots

```
# # Convert timestamp to seconds
df['timestamp'] = df['timestamp'].apply(lambda x: int(x.split(':')[2]))
```

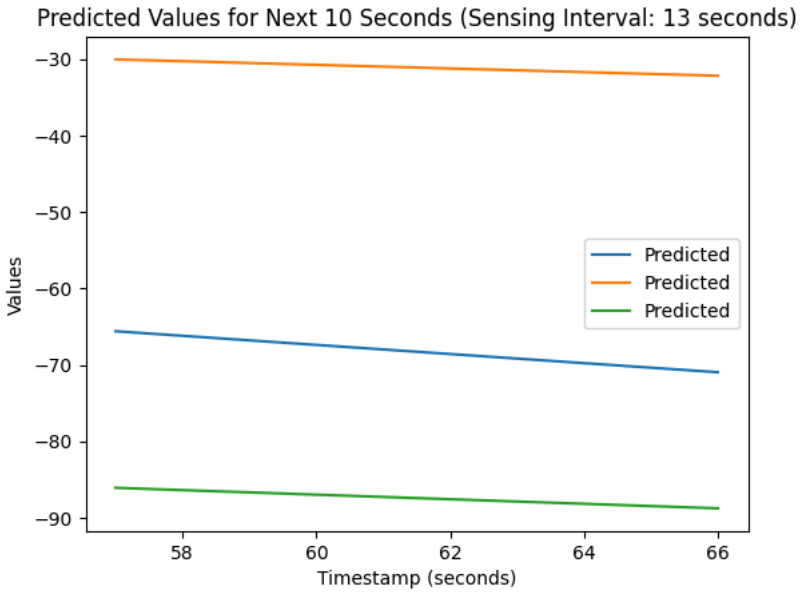
```
df['timestamp']
# # Extract only the second component
# df['second'] = df['timestamp'].dt.second
df.head()
```

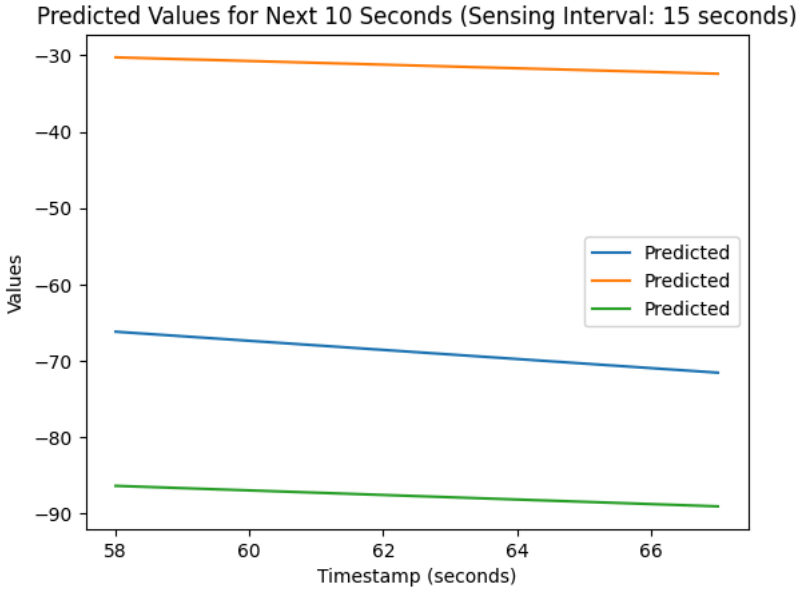
```
# Define sensing intervals
sensing_intervals = [13, 15]  # in seconds
```

```
for interval in sensing_intervals:
    # Downsample data based on sensing interval
    downsampled_df = df[df.index % interval == 0]

    # Predict next 10 seconds of data
    X_pred = pd.DataFrame({'timestamp': range(downsampled_df['timestamp'].max() + 1, downsampled_df['timestamp'].max() + 11)})
    y_pred = model.predict(X_pred)

    # Plot predicted vs actual values
    plt.plot(range(downsampled_df['timestamp'].max() + 1, downsampled_df['timestamp'].max() + 11), y_pred, label='Predicted')
    plt.title("Predicted Values for Next 10 Seconds (Sensing Interval: {} seconds)".format(interval))
    plt.xlabel("Timestamp (seconds)")
    plt.ylabel("Values")
    plt.legend()
    plt.show()
```


Predicted Values for Next 10 Seconds (Sensing Interval: 13 seconds)
Values
Timestamp (seconds)
Predicted
Predicted
Predicted


Predicted Values for Next 10 Seconds (Sensing Interval: 15 seconds)
Values
Timestamp (seconds)
Predicted
Predicted
Predicted