In [1]:

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# CRM Sales Dashboard Project

# Import necessary libraries
import pandas as pd
import matplotlib.pyplot as plt
import plotly.express as px

# Load datasets
sales_pipeline = pd.read_csv('sales_pipeline.csv')
sales_teams = pd.read_csv('sales_teams.csv')
accounts = pd.read_csv('accounts.csv')
products = pd.read_csv('products.csv')
data_dictionary = pd.read_csv('data_dictionary.csv')

# Data Preparation
# Merge sales pipeline with sales teams to include 'manager' and 'regional_office'
sales_pipeline_merged = sales_pipeline.merge(sales_teams, how='left', on='sales_agent')

# Convert 'close_date' and 'engage_date' to datetime format
sales_pipeline_merged['close_date'] = pd.to_datetime(sales_pipeline_merged['close_date'], errors='coerce')
sales_pipeline_merged['engage_date'] = pd.to_datetime(sales_pipeline_merged['engage_date'], errors='coerce')

# Create 'quarter' column for quarterly analysis
sales_pipeline_merged['quarter'] = sales_pipeline_merged['close_date'].dt.to_period('Q')

# Exploratory Data Analysis with Pivot Tables
# Opportunities Won by Quarter
pivot_won_by_quarter = sales_pipeline_merged[sales_pipeline_merged['deal_stage'] == 'Won'].pivot_table(
    index='quarter', values='opportunity_id', aggfunc='count'
).rename(columns={'opportunity_id': 'Opportunities_Won'})

# Win vs. Loss Percentage by Quarter
pivot_win_loss_percentage = sales_pipeline_merged.pivot_table(
    index='quarter', columns='deal_stage', values='opportunity_id', aggfunc='count', fill_value=0
)
pivot_win_loss_percentage = pivot_win_loss_percentage.div(
    pivot_win_loss_percentage.sum(axis=1), axis=0
).round(2) * 100

# Sales Agent Performance by Quarter
pivot_agent_performance = sales_pipeline_merged[sales_pipeline_merged['deal_stage'] == 'Won'].pivot_table(
    index='sales_agent', columns='quarter', values='opportunity_id', aggfunc='count', fill_value=0
)
most_recent_quarter = sales_pipeline_merged['quarter'].max()
pivot_agent_performance = pivot_agent_performance.sort_values(by=most_recent_quarter, ascending=False)

# Data Visualization
# Bar Chart - Opportunities Won by Quarter
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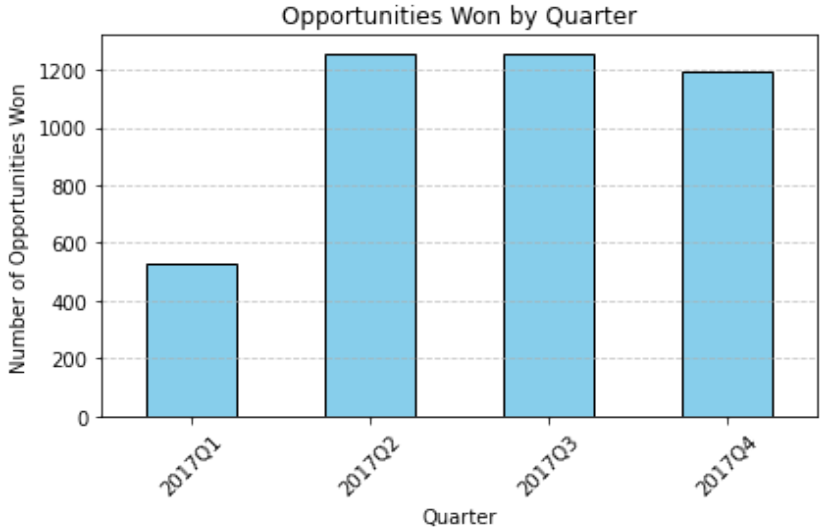
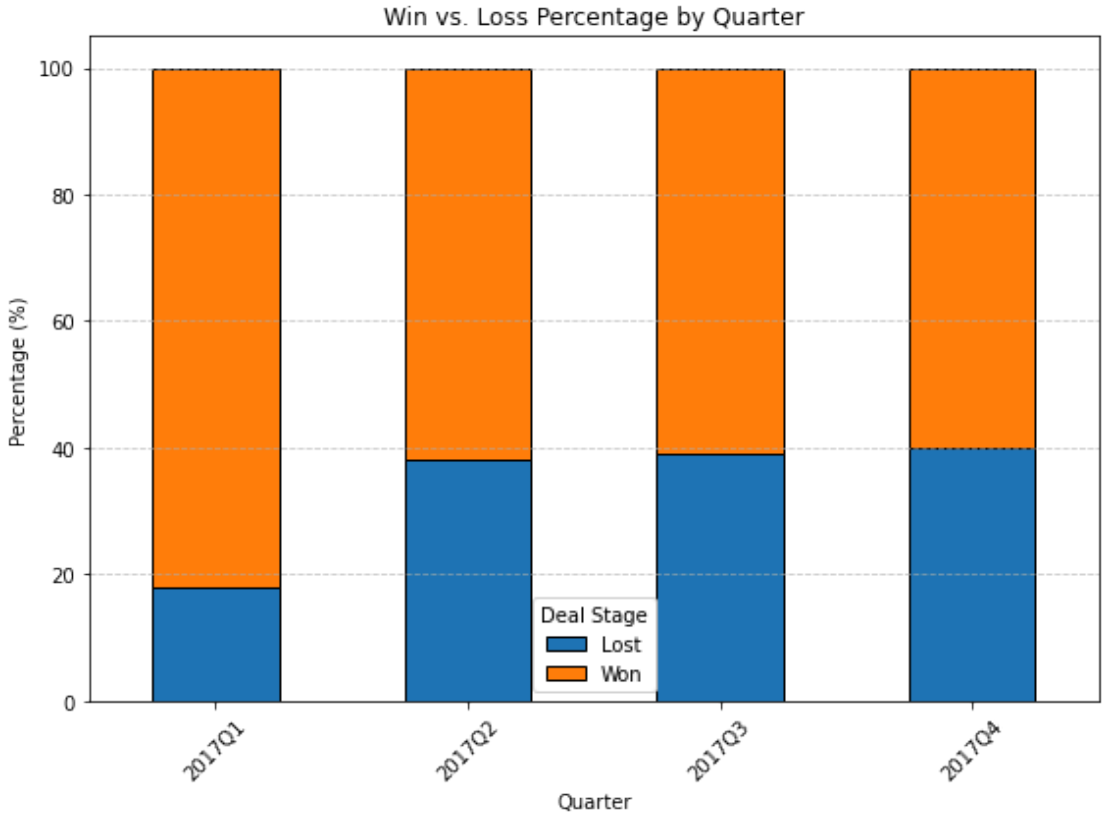
plt.figure(figsize=(8, 6))
pivot_won_by_quarter.plot(kind='bar', legend=False, color='skyblue', edgecolor='black')
plt.title('Opportunities Won by Quarter')
plt.xlabel('Quarter')
plt.ylabel('Number of Opportunities Won')
plt.xticks(rotation=45)
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()

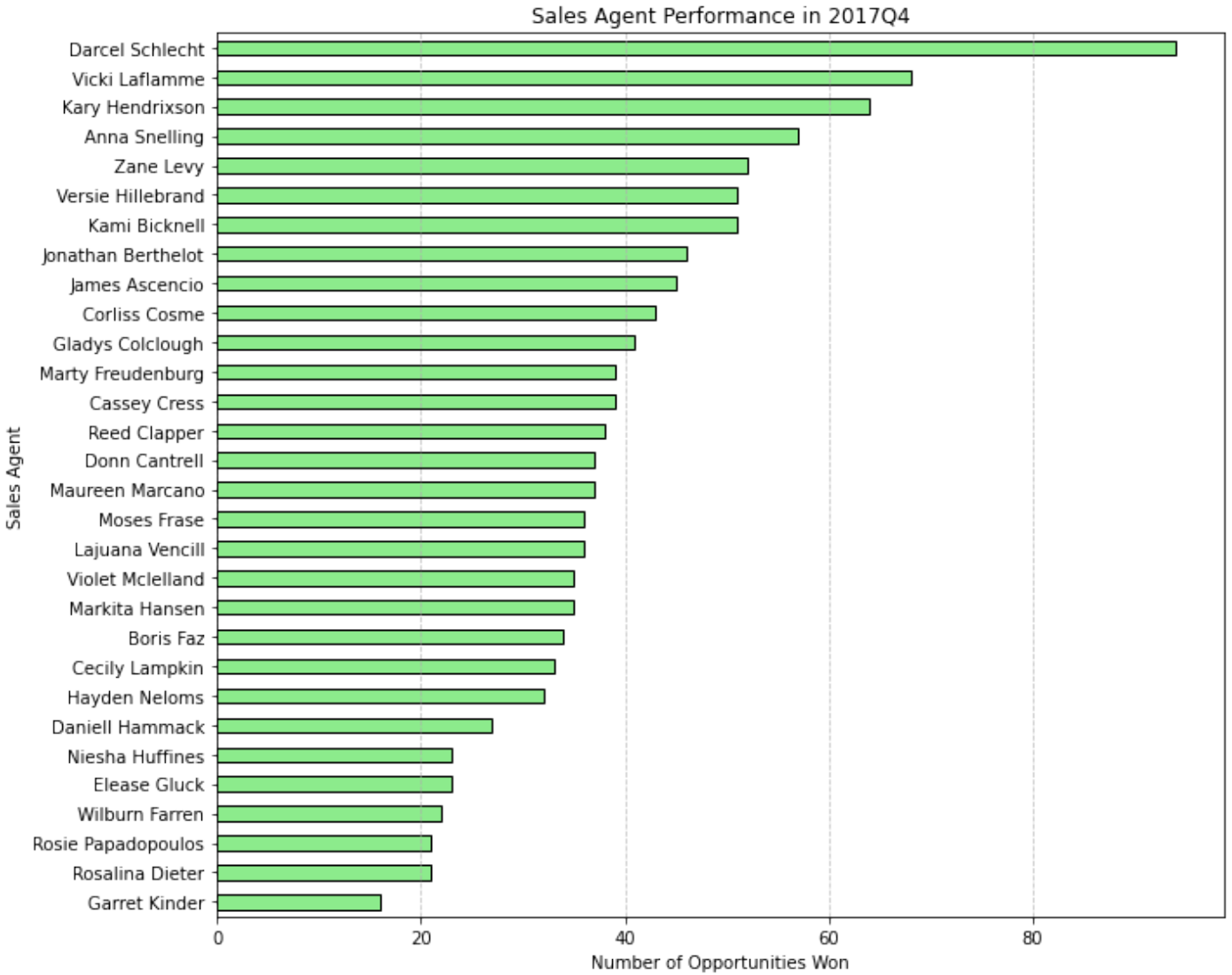
# Stacked Bar Chart - Win vs. Loss Percentage by Quarter
pivot_win_loss_percentage.plot(kind='bar', stacked=True, figsize=(8, 6), edgecolor='black')
plt.title('Win vs. Loss Percentage by Quarter')
plt.xlabel('Quarter')
plt.ylabel('Percentage (%)')
plt.legend(title='Deal Stage')
plt.xticks(rotation=45)
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()

# Horizontal Bar Chart - Sales Agent Performance
plt.figure(figsize=(10, 8))
pivot_agent_performance[most_recent_quarter].sort_values(ascending=True).plot(kind='barh', color='lightgreen', edgecolor='black')
plt.title(f'Sales Agent Performance in {most_recent_quarter}')
plt.xlabel('Number of Opportunities Won')
plt.ylabel('Sales Agent')
plt.grid(axis='x', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()

# Identify Top Sales Agent from Summer Sewald's Team in Q4 2017
q4_2017_data = sales_pipeline_merged[
    (sales_pipeline_merged['quarter'] == '2017Q4') &
    (sales_pipeline_merged['manager'] == 'Summer Sewald') &
    (sales_pipeline_merged['deal_stage'] == 'Won')
]
top_sales_agent = q4_2017_data['sales_agent'].value_counts().idxmax()
print(f"Top Sales Agent in Summer Sewald's Team for Q4 2017: {top_sales_agent}")
```


Opportunities Won by Quarter
Number of Opportunities Won
0
200
400
600
800
1000
1200
2017Q1
2017Q2
2017Q3
2017Q4
Quarter


Win vs. Loss Percentage by Quarter
Percentage (%)
0
20
40
60
80
100
Deal Stage
Lost
Won
2017Q1
2017Q2
2017Q3
2017Q4
Quarter



Top Sales Agent in Summer Sewald's Team for Q4 2017: Kary Hendrixson