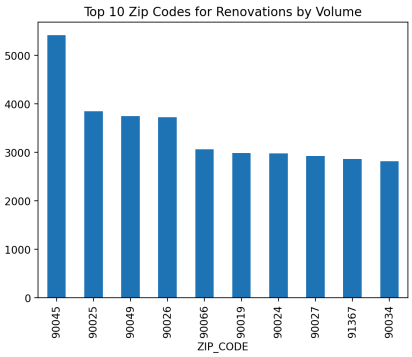
Main Question: How can Los Angeles real estate investors optimize their renovation strategies by analyzing geographic hotspots, market timing cycles, and valuation "sweet spots"?

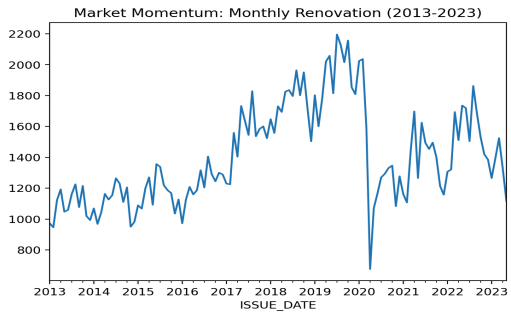
1. What are the top 10 Zip Codes for renovation by volume?

	This chart isolates the specific Los Angeles neighborhoods experiencing the highest density of renovation activity, led decisively by Zip Code 90045 which exceeds 5,000 permits. High permit volume acts as a strong proxy for market liquidity and investor confidence, suggesting these neighborhoods have active flipping ecosystems and established demand. This analysis would help direct capital towards zones with the highest probability of active development rather than stagnant markets.

Code:

```
# Create dataframe for renovations only
ren = permits[permits['PERMIT_TYPE'] == 'Bldg-Alter/Repair']

# Group by and count
top10 =
\ren.groupby('ZIP_CODE')['PCIS_PERMIT_NUM'].count().sort_values(ascending=False
\).head(10)

# Graph the top 10 neighborhoods
top10.plot(kind='bar', title='Top 10 Zip Codes for Renovations by Volume')
```

2. How has the volume of renovation activity changed over time, and what does this signal about market momentum?

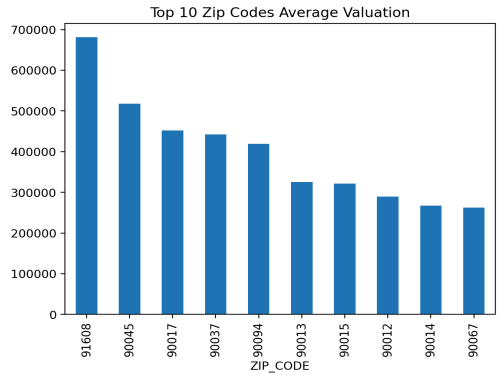
	The timeline tracks the monthly volume of renovation permits over a decade, highlighting a steady market expansion that peaked in 2019 before a sharp pandemic-induced drop in 2020. The post-2020 recovery reveals significant volatility, suggesting the market is currently in a correction phase rather than the smooth growth seen previously. This line chart will

	help real estate professionals identify temporary dips in activity that may signify lower competition and better buying opportunities.

Code:

```
# Create dataframe for renovations only
trends = permits[permits['PERMIT_TYPE'] == 'Bldg-Alter/Repair']

# Group by the month
monthly_trends = trends.groupby(pd.Grouper(key='ISSUE_DATE',
freq='ME'))['PCIS_PERMIT_NUM'].count()

# Graph the line plot
monthly_trends.plot(title = 'Market Momentum: Monthly Renovation (2013-2023)')
```

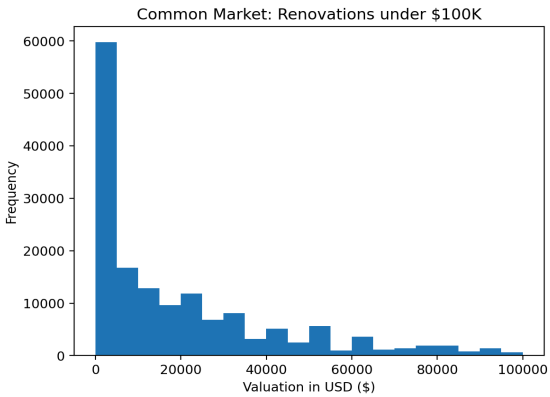
3. Which Zip Codes command the highest average renovation budgets?

	We want to identify the most capital-intensive renovation values in LA, with Zip Code 91608 leading at nearly $700K. High average valuations indicate a prevalence of luxury remodels or major alterations, implying a market with a high barrier to entry but potentially larger margin profits. This allows real estate professionals to match their target neighborhoods to their available liquidity.

Code:

```
# Group by zipcode and find average valuation for top 10
top_10 =
\trends.groupby('ZIP_CODE')['VALUATION'].mean().sort_values(ascending=False).hea
d\(10)
top_10.plot(kind='bar', title='Top 10 Zip Codes Average Valuation')
```

4. What is the typical budget range for a standard renovation project?

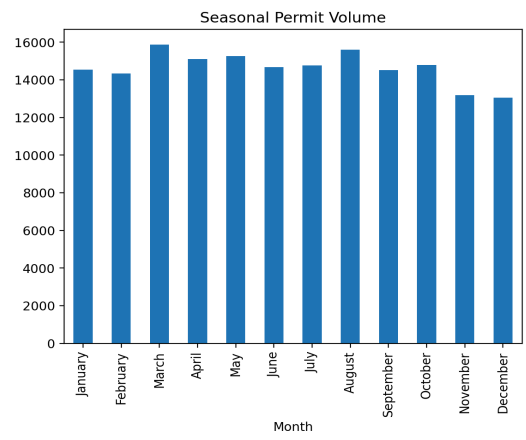


The histogram filters out high-end outliers to reveal the common market, showing the vast majority of renovation permits having valuations between $0 and $20000. Heavy concentrations at the lower end confirms that the typical LA renovation strategy is driven by cosmetic improvements such as flooring, paint, and fixtures. This would advise real estate professionals to budget for lower-cost, high-frequency updates to align with the market.

Code:

```
# Filter for renovations under $100k
ren_budget = ren[ren['VALUATION'] < 100000]
ren_budget['VALUATION'].plot(kind='hist', bins=20, title='Common Market:
Renovations under $100K', xlabel='Valuation in USD ($)')
```

5. Is there a seasonal “rush hour” for permit issuance in Los Angeles?



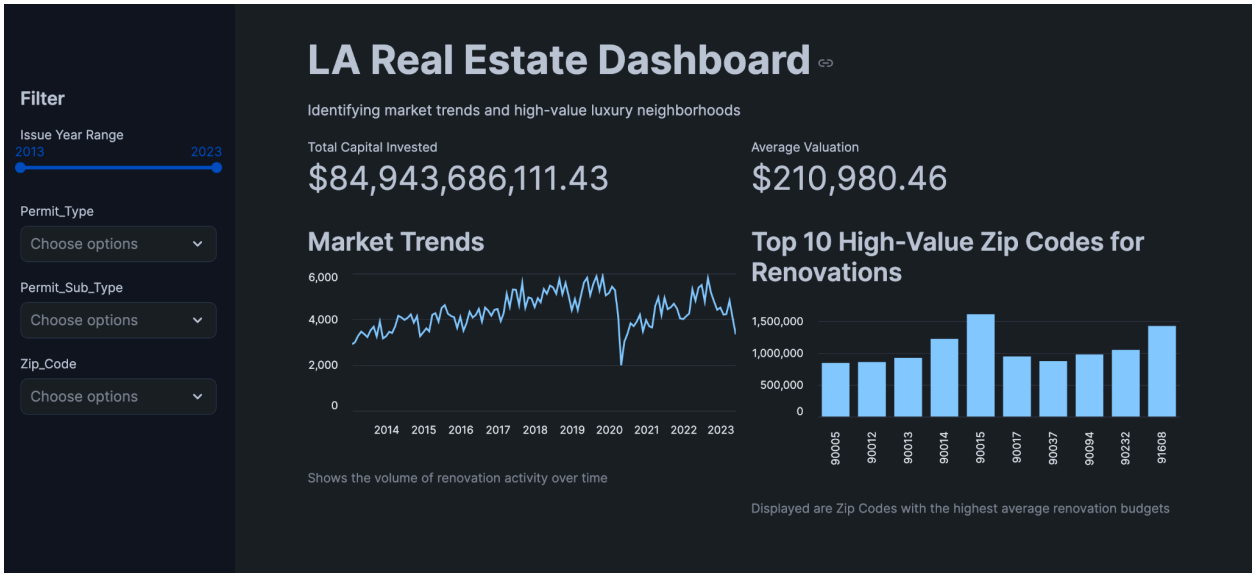
The bar chart aggregates permit data by month to reveal the administrative "rush hour" of the Los Angeles Department of Building and Safety. The data shows a distinct peak in March (nearly 16,000 permits) followed by sustained high activity, with a notable drop-off in November and December. This operational insight allows real estate professionals to strategically time their permit applications during the winter lull, thereby avoiding the spring backlog and accelerating project commencement.

Code:

```
ren = permits[permits['PERMIT_TYPE'] == 'Bldg-Alter/Repair'].copy()

# Create new column for month
ren['Month'] = ren['ISSUE_DATE'].dt.month_name()

# Group by the month and create a list of months
seasonal = ren.groupby('Month')['PCIS_PERMIT_NUM'].count()
```

```
order = ['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September',
'October', 'November', 'December']

# Make order as the index before graphing the bar chart
seasonal = seasonal.reindex(order)
seasonal.plot(kind='bar', title='Seasonal Permit Volume')
```

Dashboard:



Code:

```
# Import python packages
import streamlit as st
from snowflake.snowpark.context import get_active_session
import pandas as pd
import numpy as np

session = get_active_session()
@st.cache_data
def obtain_data():
    permits = session.sql('''
    select pcis_permit_num, status, status_date, year(status_date) as status_year,
    permit_type, permit_sub_type, initiating_office, issue_date, year(issue_date) as issue_year,
concat(address_start,' ',coalesce(street_direction,''), street_name,' ',street_suffix,'
',coalesce(suffix_direction,'')) as
address,zip_code,work_description,ai_description,valuation,license_num,
    contractor_business_name,license_type,census_tract,latitude_longitude
    from la_permit_data.public.permit_records;
```

```
    '''').to_pandas()
    permits['ISSUE_DATE']=pd.to_datetime(permits['ISSUE_DATE'])

permits['VALUATION']=pd.to_numeric(permits['VALUATION'].str.replace(r'[$,]','',regex=True))
    permits[['LONGITUDE','LATITUDE']]=permits['LATITUDE_LONGITUDE']\
                                .str.extract(r'\(([^\s]+)\s([^\s]+)\)')
    permits['LONGITUDE']=pd.to_numeric(permits['LONGITUDE'])
    permits['LATITUDE']=pd.to_numeric(permits['LATITUDE'])
    permits['DAYS_ELAPSED']=(permits['STATUS_DATE']-permits['ISSUE_DATE']).dt.days
    permits.loc[permits['STATUS']=='Issued', 'DAYS_ELAPSED']=np.nan
    return permits
permits=obtain_data()

# Convert into the proper data types
date0=permits['ISSUE_YEAR'].min()
date1=permits['ISSUE_YEAR'].max()
options={}
filters=['PERMIT_TYPE', 'PERMIT_SUB_TYPE', 'ZIP_CODE']
for col in filters:
    options[col] = permits[col].value_counts().index

# Create sidebar & filter
st.sidebar.header('Filter')
min_year, max_year = st.sidebar.slider('Issue Year Range', date0, date1, value=(date0,date1))
values = {}
for col in filters:
    values[col] = st.sidebar.multiselect(col.title(), options=options[col])

# Apply filters
def filter_data(min_year, max_year, values):
    df = permits[permits['ISSUE_YEAR'].between(min_year, max_year)]
    for col in filters:
        if len(values[col]) > 0:
            df = df[df[col].isin(values[col])]
    return df

df = filter_data(min_year, max_year, values)

# Dashboard Layout
st.set_page_config(layout='wide')
```

```
st.title('LA Real Estate Dashboard')
st.write('Identifying market trends and high-value luxury neighborhoods')

# Data for Graph 1
time = df.groupby(pd.Grouper(key='ISSUE_DATE', freq='M'))['PCIS_PERMIT_NUM'].count()

# Data for Graph 2
top10 =
df.groupby('ZIP_CODE')['VALUATION'].mean().sort_values(ascending=False).head(10)

col1,col2=st.columns(2)

# Graph 1
with col1:
    st.metric('Total Capital Invested', f"${df['VALUATION'].sum():,.2f}")
    st.subheader('Market Trends')
    st.line_chart(time,height=200)
    st.caption('Shows the volume of renovation activity over time')

# Graph 2
with col2:
    st.metric('Average Valuation', f"${df['VALUATION'].mean():,.2f}")
    st.subheader('Top 10 High-Value Zip Codes for Renovations')
    st.bar_chart(top10, height=200)
    st.caption('Displayed are Zip Codes with the highest average renovation budgets')
```