Libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import re
from geopy.geocoders import Nominatim
import plotly.express as px
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.chrome.service import Service
from webdriver_manager.chrome import ChromeDriverManager
import time
from bs4 import BeautifulSoup

driver =
webdriver.Chrome(service=Service(ChromeDriverManager().install()))
driver.get("https://www.glassdoor.com/Job/software-engineer-jobs-
SRCH_KO0,17.htm")

driver =
webdriver.Chrome(service=Service(ChromeDriverManager().install()))
driver.get("https://www.glassdoor.com/Job/software-engineer-jobs-
SRCH_KO0,17.htm")

job_data = []


# # Define a function to scrape jobs from the current page
# def scrape_page():
#     # Get the page source and parse it
#     soup = BeautifulSoup(driver.page_source, 'html.parser')

#     # Find all job cards on the page
#     job_cards = soup.find_all('li', class_=lambda x: x and
'JobsList_jobListItem' in x)

#     for job in job_cards:
#         try:
#             title_tag = job.select_one('a[data-test="job-title"]')
#             title = title_tag.get_text(strip=True) if title_tag else
"N/A"
#         except Exception as e:
#             title = "N/A"
#             print(f"Error extracting title: {e}")

#         try:
#             company_raw = job.find('div',
class_='EmployerProfile_profileContainer__63w3R').text.strip()
#               company = re.sub(r'\d\.\d$', '', company_raw)  # Remove
trailing rating like "4.8"
#           except Exception as e:
#               company = "N/A"
#               print(f"Error extracting company: {e}")

#           try:
#               location = job.find('div', {'data-test': 'emp-
location'}).text.strip()
#           except Exception as e:
#               location = "N/A"
#               print(f"Error extracting location: {e}")

#           try:
#               salary = job.find('div', {'data-test':
'detailSalary'}).text.strip()
#           except Exception as e:
#               salary = "N/A"
#               print(f"Error extracting salary: {e}")

#           job_data.append([title, company, location, salary])

# # Function to click "Show more jobs" until all jobs are loaded
# def load_all_jobs(max_clicks=15):
#       click_count = 0
#       while click_count < max_clicks:
#           try:
#               # Wait for the "Show more jobs" button to be clickable
#               next_button = WebDriverWait(driver, 10).until(
#                    EC.element_to_be_clickable((By.XPATH,
"//button[.//span[contains(text(), 'Show more jobs')]]"))
#               )

#               # If the button is found, click it
#               next_button.click()
#               click_count += 1  # Increment the click counter
#               print(f"Clicked 'Show more jobs' {click_count} times.")

#               time.sleep(5)  # Wait for new jobs to load

#               # Scrape the newly loaded jobs
#               scrape_page()

#           except Exception as e:
#               print(f"Error clicking the 'Show more jobs' button:
{e}")
#               break  # Break the loop if there's an issue (e.g.,
button not found)
```

```
# # Wait for page to load
# time.sleep(5)

# # Start loading and scraping all jobs
# scrape_page()  # Scrape the initial set of jobs
# load_all_jobs(max_clicks=15)  # Load more jobs by clicking the "Show
more jobs" button up to 15 times

# # Create the DataFrame with the data
# df = pd.DataFrame(job_data, columns=['Job Title', 'Company',
'Location', 'Salary'])

# # Print the DataFrame
# print(df)

df = pd.read_csv(r"C:\Users\hp\OneDrive\Desktop\glassdoor_jobs.csv")
```

Data Cleaning

```
duplicates = df[df.duplicated(['Company', 'Job Title'], keep=False)]

# Sort by company and title for better visualization
duplicates_sorted = duplicates.sort_values(['Company', 'Job Title'])

# Display results
print(f"Found {len(duplicates)} duplicate job titles within
companies")
print(duplicates_sorted)

# Get summary counts
dupe_summary = duplicates.groupby(['Company', 'Job
Title']).size().reset_index(name='count')
print("\nDuplicate summary:")
print(dupe_summary[dupe_summary['count'] > 1])
```

Salary Cleaning

```
def extract_salary(salary_str):
    if pd.isna(salary_str):
        return np.nan, np.nan

    # Handle hourly rates
    if 'Per Hour' in salary_str:
        numbers = re.findall(r'\d+\.?\d*', salary_str)
        if len(numbers) >= 2:
            low = float(numbers[0]) * 2080  # Convert hourly to annual
(2080 work hours/year)
            high = float(numbers[1]) * 2080
            return low, high
        elif len(numbers) == 1:
            val = float(numbers[0]) * 2080
            return val, val

    # Handle salary ranges
    numbers = re.findall(r'\d+\.?\d*', salary_str.replace(',', ''))
    if 'K' in salary_str:
        if len(numbers) >= 2:
            return float(numbers[0]) * 1000, float(numbers[1]) * 1000
        elif len(numbers) == 1:
            val = float(numbers[0]) * 1000
            return val, val
    else:
        if len(numbers) >= 2:
            return float(numbers[0]), float(numbers[1])
        elif len(numbers) == 1:
            val = float(numbers[0])
            return val, val

    return np.nan, np.nan

df[['salary_low', 'salary_high']] = df['Salary'].apply(
    lambda x: pd.Series(extract_salary(x)))
df['salary_avg'] = (df['salary_low'] + df['salary_high']) / 2
```

Processing Job Title Into Experience

```
def get_experience_level(title):
    title = str(title).lower()
    if 'junior' in title or 'entry' in title or 'i ' in title or
'associate' in title:
        return 'Entry'
    elif 'senior' in title or 'sr.' in title or 'iii' in title or '3'
in title:
        return 'Senior'
    elif 'ii' in title or '2' in title or 'mid' in title:
        return 'Mid'
    elif 'i' in title or '1' in title:
        return 'Entry'
    else:
        return 'Not Specified'

df['experience_level'] = df['Job Title'].apply(get_experience_level)
```

Categorizing Jobs

```

def extract_tech(title):
    title = str(title).lower()
    techs = []
    if 'java' in title:
        techs.append('Java')
    if 'python' in title:
        techs.append('Python')
    if 'c++' in title:
        techs.append('C++')
    if 'backend' in title:
        techs.append('Backend')
    if 'frontend' in title or 'front end' in title:
        techs.append('Frontend')
    if 'full stack' in title:
        techs.append('Full Stack')
    if 'data' in title:
        techs.append('Data')
    if 'cloud' in title:
        techs.append('Cloud')
    return ', '.join(techs) if techs else 'Other'


df['tech_keywords'] = df['Job Title'].apply(extract_tech)
tech_salaries = df.groupby('tech_keywords')
['salary_avg'].mean().sort_values(ascending=False)
```

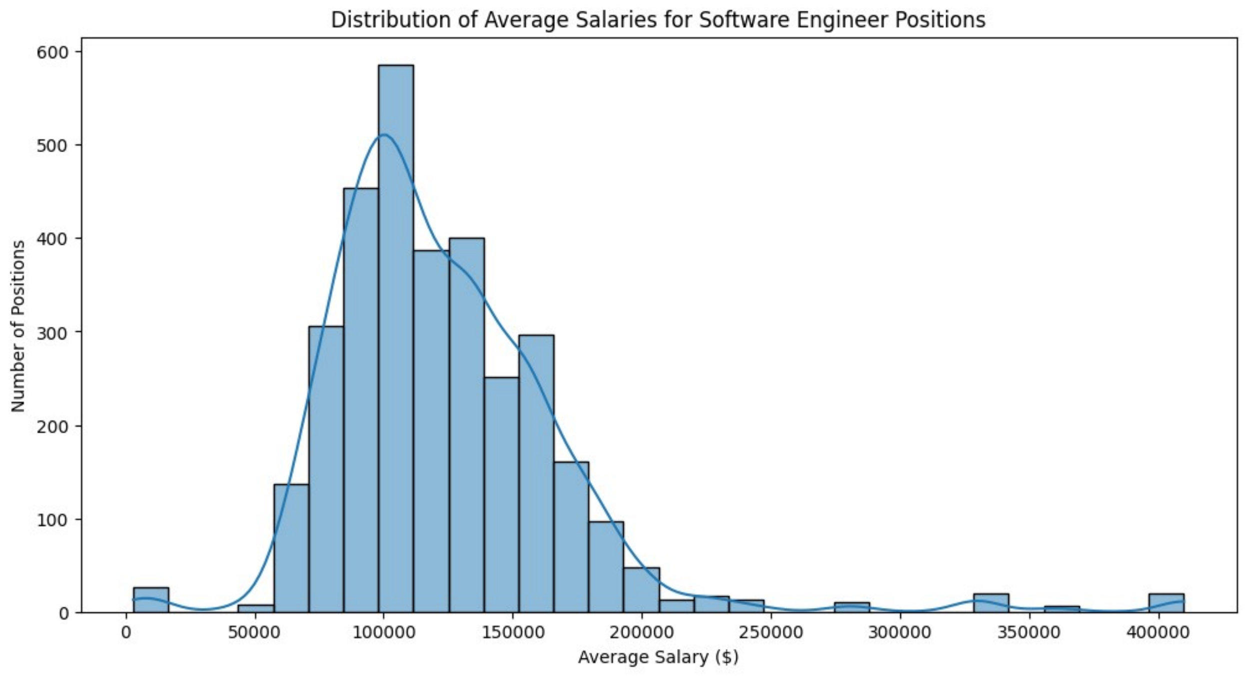
Locations

```
df['is_remote'] = df['Location'].str.contains('remote', case=False)

# Clean location data
def clean_location(loc):
    if pd.isna(loc) or 'remote' in str(loc).lower() or 'united states'
in str(loc).lower():
        return 'Remote'
    loc = str(loc).split(',')[0].strip()
    return loc

df['clean_location'] = df['Location'].apply(clean_location)
```

Visualiztions

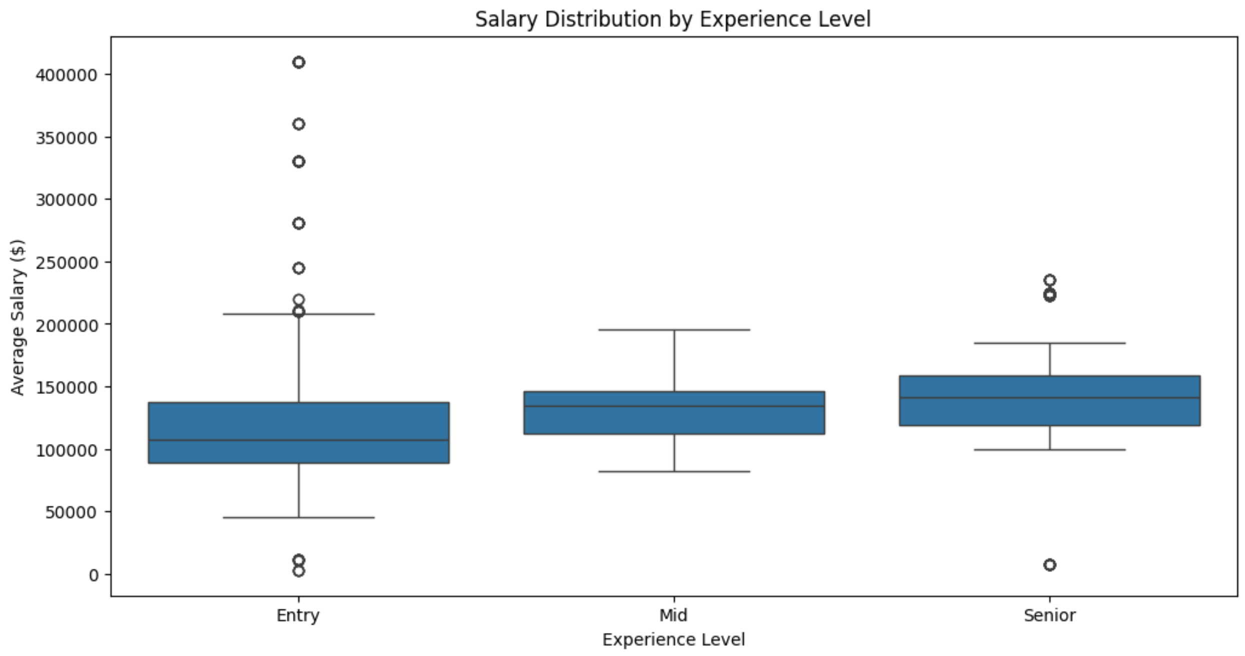
Salary Distribution

```
plt.figure(figsize=(12, 6))
sns.histplot(df['salary_avg'].dropna(), bins=30, kde=True)
plt.title('Distribution of Average Salaries for Software Engineer
Positions')
plt.xlabel('Average Salary ($)')
plt.ylabel('Number of Positions')
plt.show()
```



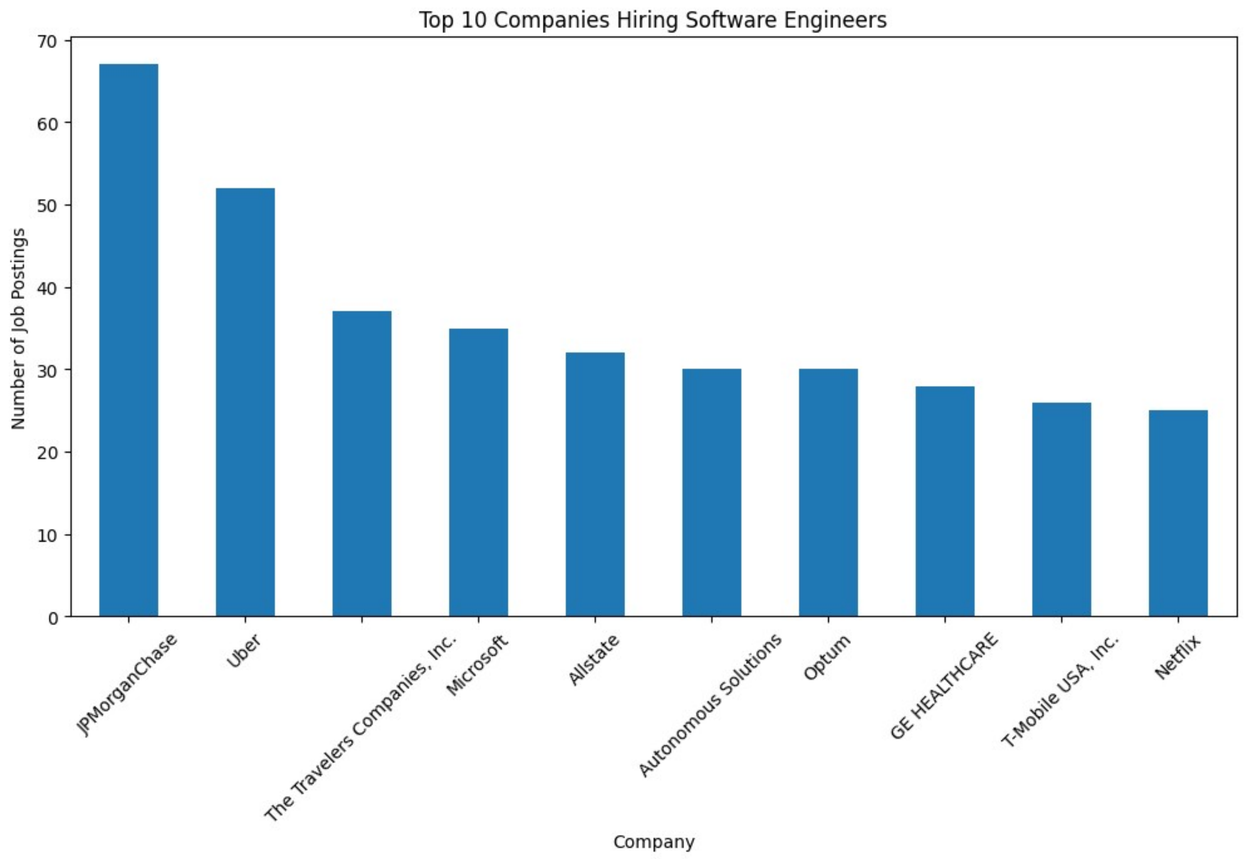
Salary By Experince Level

```
plt.figure(figsize=(12, 6))
sns.boxplot(x='experience_level', y='salary_avg',
data=df[df['experience_level'] != 'Not Specified'],
            order=['Entry', 'Mid', 'Senior'])
plt.title('Salary Distribution by Experience Level')
plt.xlabel('Experience Level')
plt.ylabel('Average Salary ($)')
plt.show()
```



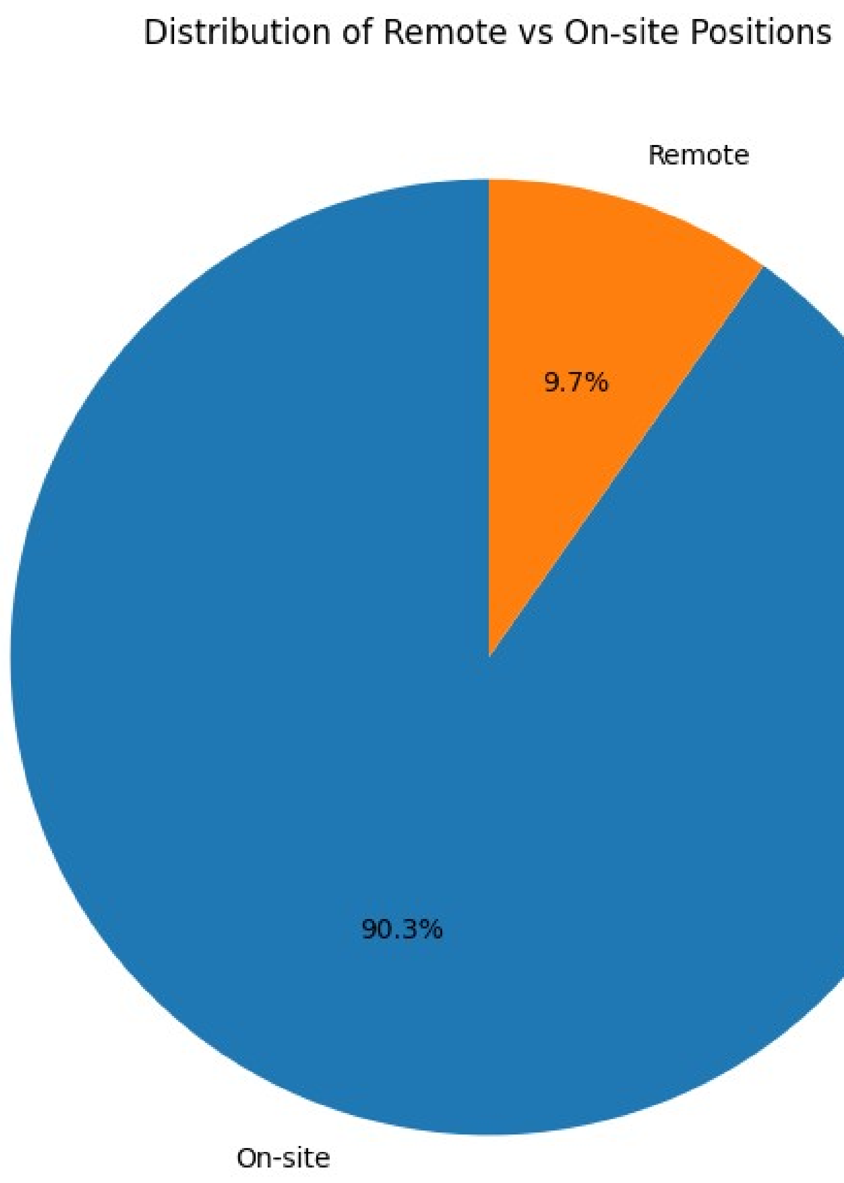
Top Hiring Companies

```
top_companies = df['Company'].value_counts().head(10)
plt.figure(figsize=(12, 6))
top_companies.plot(kind='bar')
plt.title('Top 10 Companies Hiring Software Engineers')
plt.xlabel('Company')
plt.ylabel('Number of Job Postings')
plt.xticks(rotation=45)
plt.show()
```



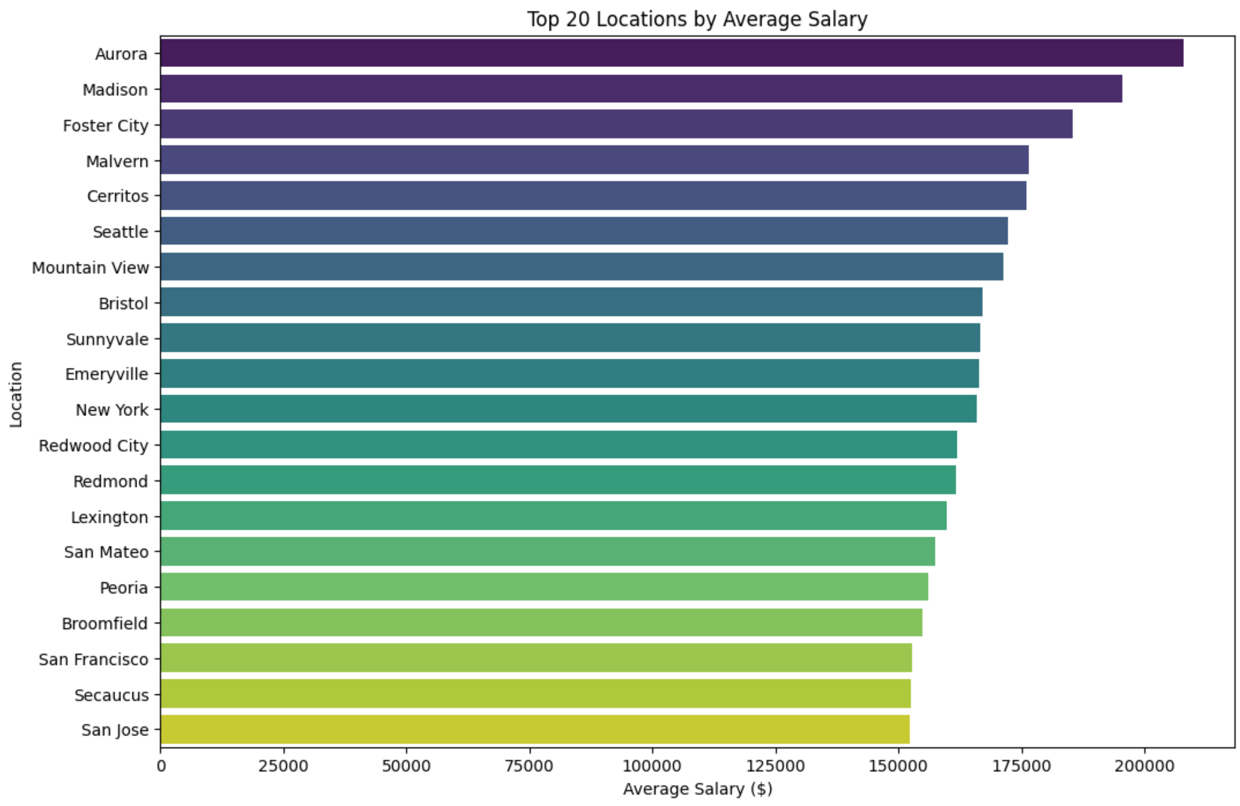
Remote Jobs Vs On-Site

```
remote_counts = df['is_remote'].value_counts()
plt.figure(figsize=(8, 8))
plt.pie(remote_counts, labels=['On-site', 'Remote'], autopct='%1.1f%
%', startangle=90)
plt.title('Distribution of Remote vs On-site Positions')
plt.show()
```



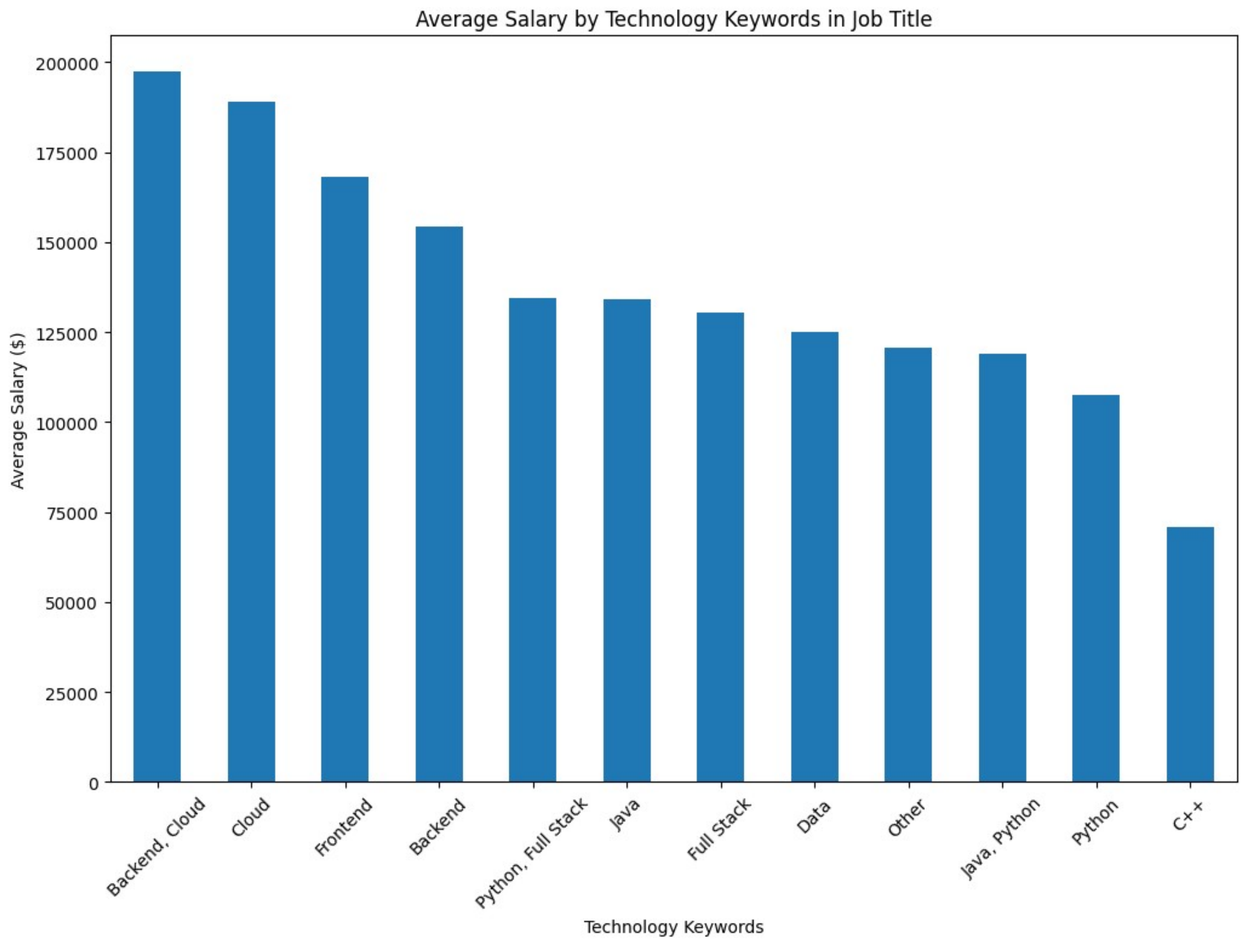
Top Paying Locations On Average

```
geo_df = df[df['clean_location'] !=
'Remote'].groupby('clean_location')['salary_avg'].mean().reset_index()
geo_df = geo_df.sort_values('salary_avg', ascending=False).head(20)

plt.figure(figsize=(12, 8))
sns.barplot(x='salary_avg', y='clean_location', data=geo_df,
palette='viridis')
plt.title('Top 20 Locations by Average Salary')
plt.xlabel('Average Salary ($)')
plt.ylabel('Location')
plt.show()

C:\Users\hp\AppData\Local\Temp\ipykernel_5984\2931021140.py:5:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `y` variable to `hue` and set
`legend=False` for the same effect.

  sns.barplot(x='salary_avg', y='clean_location', data=geo_df,
palette='viridis')
```



Average Salary For Each Job

```
plt.figure(figsize=(12, 8))
tech_salaries.plot(kind='bar')
plt.title('Average Salary by Technology Keywords in Job Title')
plt.xlabel('Technology Keywords')
plt.ylabel('Average Salary ($)')
plt.xticks(rotation=45)
plt.show()
```


Average Salary by Technology Keywords in Job Title
Average Salary ($)
200000
175000
150000
125000
100000
75000
50000
25000
0
Backend, Cloud
Cloud
Frontend
Backend
Python, Full Stack
Java
Full Stack
Data
Other
Java, Python
Python
C++
Technology Keywords

```python
import streamlit as st
import pandas as pd
import plotly.express as px
import numpy as np

file =st.file_uploader("upload file",type=["csv"])

if file is not None:
    df =pd.read_csv(file)


    n_row=st.slider("choose number of column", min_value=5,
max_value=len(df), step=1)

    column_view = st.multiselect("select columns to show",
df.columns.to_list(), default=df.columns.to_list())

    numerial_col= df.select_dtypes(include
=np.number).columns.to_list()

    st.write(df[:n_row][column_view])


    x_column=st.selectbox("select column on x axis:",numerial_col)


    ## Visualiztions

    fig=px.histogram(df,
                     x=x_column,
                     nbins=30,
                     title='Distribution of Average Salaries for
Software Engineer Positions')
    st.plotly_chart(fig)



    ### Salary By Experince Level

    filtered_df = df[df['experience_level'] != 'Not Specified']
    # Create Plotly boxplot
    figy = px.box(df,
             x='experience_level',
             y=x_column,
             category_orders={'experience_level': ['Entry', 'Mid',
'Senior']},
             title='Salary Distribution by Experience Level')

    # Show the plot in Streamlit
    st.plotly_chart(figy)
    ### Top Hiring Companies
    # Assuming df is already loaded
    top_companies =
df['Company'].value_counts().head(10).reset_index()
    top_companies.columns = ['Company', 'Job Postings']

    # Create interactive bar chart
    fig = px.bar(top_companies,
             x='Company',
             y='Job Postings',
             title='Top 10 Companies Hiring Software Engineers',
             color_discrete_sequence=['#FF5733'])

    # Show in Streamlit
    st.plotly_chart(fig)





### Top Paying Locations On Average

    geo_df = df[df['clean_location'] !=
'Remote'].groupby('clean_location')['salary_avg'].mean().reset_index()
    geo_df = geo_df.sort_values('salary_avg',
ascending=False).head(20)

# Create interactive horizontal bar chart
    fig = px.bar(geo_df,
             x='salary_avg',
             y='clean_location',
             orientation='h',
             title='Top 20 Locations by Average Salary',
             color='salary_avg',
             color_continuous_scale='viridis')  # Same color palette
as your Seaborn plot

# Adjust layout (optional: to reverse order like Seaborn's descending)
    fig.update_layout(yaxis={'categoryorder':'total ascending'},
                  xaxis_title='Average Salary ($)',
                  yaxis_title='Location')

# Show in Streamlit
    st.plotly_chart(fig)
```

```
  ### Remote Jobs Vs On-Site


    remote_counts = df['is_remote'].value_counts()

# Map the value counts (0 and 1) to human-readable labels
    labels = ['On-site' if x == 0 else 'Remote' for x in
remote_counts.index]

# Create the pie chart
    fig = px.pie(values=remote_counts,
             names=labels,
             title='Distribution of Remote vs On-site Positions',
             color=labels,  # Coloring by 'On-site' and 'Remote'
             color_discrete_map={'On-site': '#FF7F50', 'Remote':
'#87CEFA'})  # Custom colors

# Show the pie chart in Streamlit
    st.plotly_chart(fig)
```