In [1]:
```
# Import dependencies
from sqlalchemy import create_engine
from db_pw import id, pw

import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```
# Create an engine to read data from the database
engine = create_engine(f"postgresql://{id}:{pw}@localhost/employee")
```

In [3]:
```
# Get salary data
salary_df = pd.read_sql("salaries", engine)
salary_df.head()
```

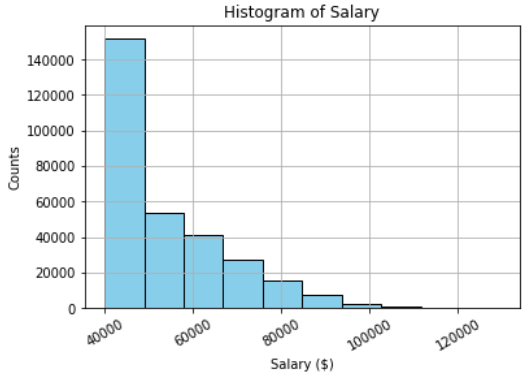
Out[3]:

	emp_no	salary
0	10001	60117
1	10002	65828
2	10003	40006
3	10004	40054
4	10005	78228

In [4]:
```
# Check if there's null value
salary_df.isnull().sum()
```

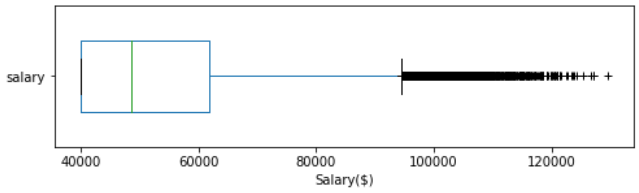
Out[4]:
```
emp_no    0
salary    0
dtype: int64
```

In [5]:
```
# Plot a histogram to see the most common salary range.
bins = 10
salary_df["salary"].hist(bins = bins, color = "skyblue", ec = "black")
plt.xlabel("Salary ($)")
plt.ylabel("Counts")
plt.title("Histogram of Salary")
plt.xticks(rotation = 30)
plt.show()
```



In [6]:
```
# Calculate quartiles
mean = salary_df["salary"].mean()
std = salary_df["salary"].std(ddof = 0)
lowerq = salary_df["salary"].quantile([0.25, 0.5, 0.75])[0.25]
med = salary_df["salary"].quantile([0.25, 0.5, 0.75])[0.5]
upperq = salary_df["salary"].quantile([0.25, 0.5, 0.75])[0.75]
iqr = upperq - lowerq
lower_bound = lowerq - (1.5 * iqr)
upper_bound = upperq + (1.5 * iqr)
```

In [7]:
```
# Plot a boxplot
plt.figure(figsize = (8,2))
salary_df["salary"].plot.box(vert = False, sym = "+", widths=0.5)
plt.xlabel("Salary($)")
plt.show()
print("Mean: ", round(mean, 2))
print("Std. Deviation: ", round(std, 2))
print("Median: ", med)
print("Q1: ", lowerq)
print("Q3: ", upperq)
print("Lower Bound: ", lower_bound)
print("Upper Bound: ", upper_bound)
```




```
Mean:  52970.73
Std. Deviation:  14301.45
Median:  48681.0
Q1:  40000.0
Q3:  61758.0
Lower Bound:  7363.0
Upper Bound:  94395.0
```

In [8]:
```
# Read title and employee data
title_df = pd.read_sql("titles", engine)
employees_df = pd.read_sql("employees", engine)
```

In [9]:
```
# Check if there's null value
print(title_df.isnull().sum())
print(employees_df.isnull().sum())
```

```
title_id    0
title       0
dtype: int64
emp_no        0
emp_title     0
birth_date    0
first_name    0
last_name     0
sex           0
hire_date     0
dtype: int64
```

In [10]:
```
# Merge all data
merge_df = pd.merge(employees_df, title_df, left_on = "emp_title", right_on = "title_id", how = "inner")
merge_df = pd.merge(merge_df, salary_df, on = "emp_no", how = "inner")
```

In [11]:
```
merge_df.head()
```

Out[11]:

	emp_no	emp_title	birth_date	first_name	last_name	sex	hire_date	title_id	title	salary
0	473302	s0001	1953-07-25	Hideyuki	Zallocco	M	1990-04-28	s0001	Staff	40000
1	421786	s0001	1957-09-28	Xiong	Verhoeff	M	1987-11-26	s0001	Staff	40000
2	273487	s0001	1957-04-14	Christoph	Parfitt	M	1991-06-28	s0001	Staff	56087
3	246449	s0001	1958-03-23	Subbu	Bultermann	F	1988-03-25	s0001	Staff	87084
4	48085	s0001	1964-01-19	Venkatesan	Gilg	M	1993-06-28	s0001	Staff	63016

In [12]:
```
# Calculate average salaries by title
group_df = merge_df.loc[:, ["title", "salary"]].groupby("title").mean()
```

In [13]:
```
# Plot a bar chart to reflect average salaries by title
group_df.plot.bar(color = "skyblue")
plt.title("Avg. Salary by title")
plt.xlabel("Title")
plt.ylabel("Avg. Salary ($)")
plt.xticks(rotation = 30)
plt.show()
```

In [14]:
```
# Search for my ID number, 499942, Oh, it's April foolsday!
merge_df.loc[merge_df.loc[:, "emp_no"] == 499942]
```

Out[14]:

	emp_no	emp_title	birth_date	first_name	last_name	sex	hire_date	title_id	title	salary
287532	499942	e0004	1963-01-10	April	Foolsday	F	1997-02-10	e0004	Technique Leader	40000