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1. Đọc file csv và hiển thị dữ liệu

```
In [9]:  import pandas as pd

         # Đặt tên cột
         column_names = ["sepal_length", "sepal_width", "petal_length", "petal_width"
         df = pd.read_csv("iris.data", header=None, names=column_names)
         pd.set_option("display.max_rows", None)  # Hiển thị tất cả các dòng
         print(df)
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
5	5.4	3.9	1.7	0.4	Iris-setosa
6	4.6	3.4	1.4	0.3	Iris-setosa
7	5.0	3.4	1.5	0.2	Iris-setosa
8	4.4	2.9	1.4	0.2	Iris-setosa
9	4.9	3.1	1.5	0.1	Iris-setosa
10	5.4	3.7	1.5	0.2	Iris-setosa
11	4.8	3.4	1.6	0.2	Iris-setosa
12	4.8	3.0	1.4	0.1	Iris-setosa
13	4.3	3.0	1.1	0.1	Iris-setosa
14	5.8	4.0	1.2	0.2	Iris-setosa
15	5.7	4.4	1.5	0.4	Iris-setosa
16	5.4	3.9	1.3	0.4	Iris-setosa
17	5.1	3.5	1.4	0.3	Iris-setosa
18	5.7	3.8	1.7	0.3	Iris-setosa
19	5.1	3.8	1.5	0.3	Iris-setosa
20	5.4	3.4	1.7	0.2	Iris-setosa
21	5.1	3.7	1.5	0.4	Iris-setosa
22	4.6	3.6	1.0	0.2	Iris-setosa
23	5.1	3.3	1.7	0.5	Iris-setosa
24	4.8	3.4	1.9	0.2	Iris-setosa
25	5.0	3.0	1.6	0.2	Iris-setosa
26	5.0	3.4	1.6	0.4	Iris-setosa
27	5.2	3.5	1.5	0.2	Iris-setosa
28	5.2	3.4	1.4	0.2	Iris-setosa
29	4.7	3.2	1.6	0.2	Iris-setosa
30	4.8	3.1	1.6	0.2	Iris-setosa
31	5.4	3.4	1.5	0.4	Iris-setosa
32	5.2	4.1	1.5	0.1	Iris-setosa
33	5.5	4.2	1.4	0.2	Iris-setosa
34	4.9	3.1	1.5	0.1	Iris-setosa
35	5.0	3.2	1.2	0.2	Iris-setosa
36	5.5	3.5	1.3	0.2	Iris-setosa
37	4.9	3.1	1.5	0.1	Iris-setosa
38	4.4	3.0	1.3	0.2	Iris-setosa
39	5.1	3.4	1.5	0.2	Iris-setosa
40	5.0	3.5	1.3	0.3	Iris-setosa
41	4.5	2.3	1.3	0.3	Iris-setosa
42	4.4	3.2	1.3	0.2	Iris-setosa
43	5.0	3.5	1.6	0.6	Iris-setosa
44	5.1	3.8	1.9	0.4	Iris-setosa
45	4.8	3.0	1.4	0.3	Iris-setosa
46	5.1	3.8	1.6	0.2	Iris-setosa
47	4.6	3.2	1.4	0.2	Iris-setosa
48	5.3	3.7	1.5	0.2	Iris-setosa
49	5.0	3.3	1.4	0.2	Iris-setosa
50	7.0	3.2	4.7	1.4	Iris-versicolor
51	6.4	3.2	4.5	1.5	Iris-versicolor
52	6.9	3.1	4.9	1.5	Iris-versicolor
53	5.5	2.3	4.0	1.3	Iris-versicolor
54	6.5	2.8	4.6	1.5	Iris-versicolor

55	5.7	2.8	4.5	1.3	Iris-versicolor
56	6.3	3.3	4.7	1.6	Iris-versicolor
57	4.9	2.4	3.3	1.0	Iris-versicolor
58	6.6	2.9	4.6	1.3	Iris-versicolor
59	5.2	2.7	3.9	1.4	Iris-versicolor
60	5.0	2.0	3.5	1.0	Iris-versicolor
61	5.9	3.0	4.2	1.5	Iris-versicolor
62	6.0	2.2	4.0	1.0	Iris-versicolor
63	6.1	2.9	4.7	1.4	Iris-versicolor
64	5.6	2.9	3.6	1.3	Iris-versicolor
65	6.7	3.1	4.4	1.4	Iris-versicolor
66	5.6	3.0	4.5	1.5	Iris-versicolor
67	5.8	2.7	4.1	1.0	Iris-versicolor
68	6.2	2.2	4.5	1.5	Iris-versicolor
69	5.6	2.5	3.9	1.1	Iris-versicolor
70	5.9	3.2	4.8	1.8	Iris-versicolor
71	6.1	2.8	4.0	1.3	Iris-versicolor
72	6.3	2.5	4.9	1.5	Iris-versicolor
73	6.1	2.8	4.7	1.2	Iris-versicolor
74	6.4	2.9	4.3	1.3	Iris-versicolor
75	6.6	3.0	4.4	1.4	Iris-versicolor
76	6.8	2.8	4.8	1.4	Iris-versicolor
77	6.7	3.0	5.0	1.7	Iris-versicolor
78	6.0	2.9	4.5	1.5	Iris-versicolor
79	5.7	2.6	3.5	1.0	Iris-versicolor
80	5.5	2.4	3.8	1.1	Iris-versicolor
81	5.5	2.4	3.7	1.0	Iris-versicolor
82	5.8	2.7	3.9	1.2	Iris-versicolor
83	6.0	2.7	5.1	1.6	Iris-versicolor
84	5.4	3.0	4.5	1.5	Iris-versicolor
85	6.0	3.4	4.5	1.6	Iris-versicolor
86	6.7	3.1	4.7	1.5	Iris-versicolor
87	6.3	2.3	4.4	1.3	Iris-versicolor
88	5.6	3.0	4.1	1.3	Iris-versicolor
89	5.5	2.5	4.0	1.3	Iris-versicolor
90	5.5	2.6	4.4	1.2	Iris-versicolor
91	6.1	3.0	4.6	1.4	Iris-versicolor
92	5.8	2.6	4.0	1.2	Iris-versicolor
93	5.0	2.3	3.3	1.0	Iris-versicolor
94	5.6	2.7	4.2	1.3	Iris-versicolor
95	5.7	3.0	4.2	1.2	Iris-versicolor
96	5.7	2.9	4.2	1.3	Iris-versicolor
97	6.2	2.9	4.3	1.3	Iris-versicolor
98	5.1	2.5	3.0	1.1	Iris-versicolor
99	5.7	2.8	4.1	1.3	Iris-versicolor
100	6.3	3.3	6.0	2.5	Iris-virginica
101	5.8	2.7	5.1	1.9	Iris-virginica
102	7.1	3.0	5.9	2.1	Iris-virginica
103	6.3	2.9	5.6	1.8	Iris-virginica
104	6.5	3.0	5.8	2.2	Iris-virginica
105	7.6	3.0	6.6	2.1	Iris-virginica
106	4.9	2.5	4.5	1.7	Iris-virginica
107	7.3	2.9	6.3	1.8	Iris-virginica
108	6.7	2.5	5.8	1.8	Iris-virginica
109	7.2	3.6	6.1	2.5	Iris-virginica
110	6.5	3.2	5.1	2.0	Iris-virginica

```
111          6.4          2.7          5.3          1.9    Iris-virginica
112          6.8          3.0          5.5          2.1    Iris-virginica
113          5.7          2.5          5.0          2.0    Iris-virginica
114          5.8          2.8          5.1          2.4    Iris-virginica
115          6.4          3.2          5.3          2.3    Iris-virginica
116          6.5          3.0          5.5          1.8    Iris-virginica
117          7.7          3.8          6.7          2.2    Iris-virginica
118          7.7          2.6          6.9          2.3    Iris-virginica
119          6.0          2.2          5.0          1.5    Iris-virginica
120          6.9          3.2          5.7          2.3    Iris-virginica
121          5.6          2.8          4.9          2.0    Iris-virginica
122          7.7          2.8          6.7          2.0    Iris-virginica
123          6.3          2.7          4.9          1.8    Iris-virginica
124          6.7          3.3          5.7          2.1    Iris-virginica
125          7.2          3.2          6.0          1.8    Iris-virginica
126          6.2          2.8          4.8          1.8    Iris-virginica
127          6.1          3.0          4.9          1.8    Iris-virginica
128          6.4          2.8          5.6          2.1    Iris-virginica
129          7.2          3.0          5.8          1.6    Iris-virginica
130          7.4          2.8          6.1          1.9    Iris-virginica
131          7.9          3.8          6.4          2.0    Iris-virginica
132          6.4          2.8          5.6          2.2    Iris-virginica
133          6.3          2.8          5.1          1.5    Iris-virginica
134          6.1          2.6          5.6          1.4    Iris-virginica
135          7.7          3.0          6.1          2.3    Iris-virginica
136          6.3          3.4          5.6          2.4    Iris-virginica
137          6.4          3.1          5.5          1.8    Iris-virginica
138          6.0          3.0          4.8          1.8    Iris-virginica
139          6.9          3.1          5.4          2.1    Iris-virginica
140          6.7          3.1          5.6          2.4    Iris-virginica
141          6.9          3.1          5.1          2.3    Iris-virginica
142          5.8          2.7          5.1          1.9    Iris-virginica
143          6.8          3.2          5.9          2.3    Iris-virginica
144          6.7          3.3          5.7          2.5    Iris-virginica
145          6.7          3.0          5.2          2.3    Iris-virginica
146          6.3          2.5          5.0          1.9    Iris-virginica
147          6.5          3.0          5.2          2.0    Iris-virginica
148          6.2          3.4          5.4          2.3    Iris-virginica
149          5.9          3.0          5.1          1.8    Iris-virginica
```

2. Cho biết kiểu dữ liệu các cột

In [10]:
```python
import pandas as pd


column_names = ["sepal_length", "sepal_width", "petal_length", "petal_width"
df = pd.read_csv("iris.data", header=None, names=column_names)

print("== Kiểu dữ liệu của các cột ==")
print(df.dtypes)
```

```
== Kiểu dữ liệu của các cột ==
sepal_length    float64
sepal_width     float64
petal_length    float64
petal_width     float64
species          object
dtype: object
```

3. Hiển thị các giá trị thống kê (count, mean, std,...)

```python
In [11]: import pandas as pd


column_names = ["sepal_length", "sepal_width", "petal_length", "petal_width"
df = pd.read_csv("iris.data", header=None, names=column_names)


print("== Thống kê mô tả các thuộc tính sô´==")
print(df.describe())
```

```
== Thống kê mô tả các thuộc tính sô´==
        sepal_length  sepal_width  petal_length  petal_width
count     150.000000   150.000000    150.000000   150.000000
mean        5.843333     3.054000      3.758667     1.198667
std         0.828066     0.433594      1.764420     0.763161
min         4.300000     2.000000      1.000000     0.100000
25%         5.100000     2.800000      1.600000     0.300000
50%         5.800000     3.000000      4.350000     1.300000
75%         6.400000     3.300000      5.100000     1.800000
max         7.900000     4.400000      6.900000     2.500000
```
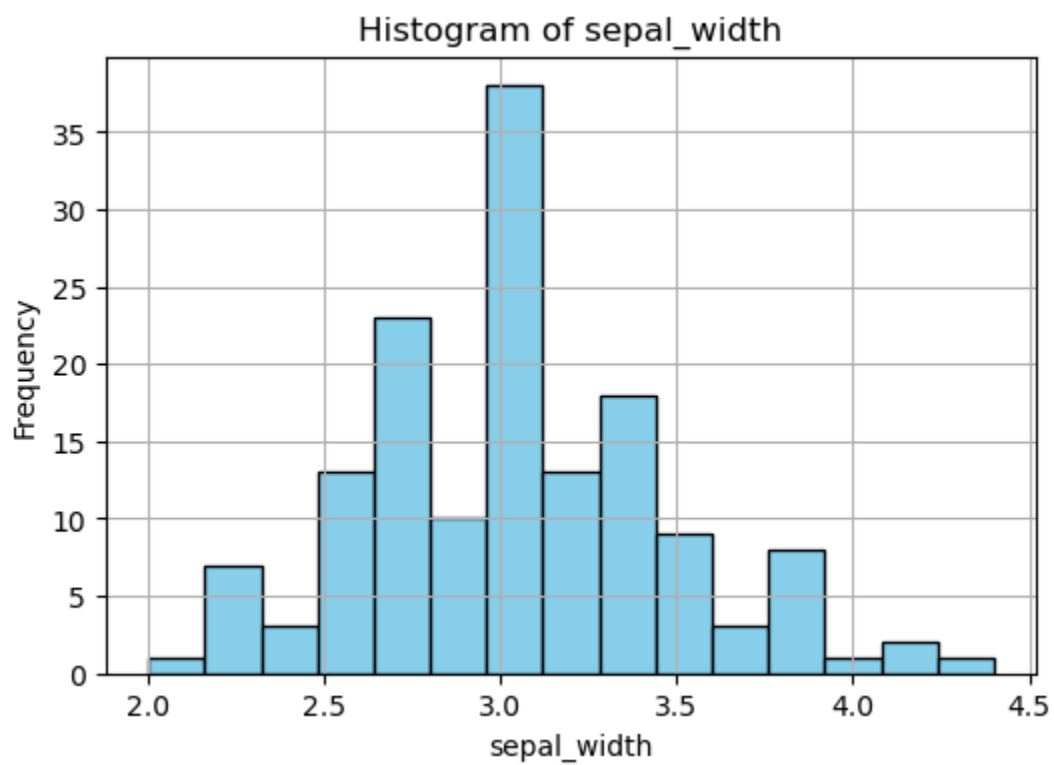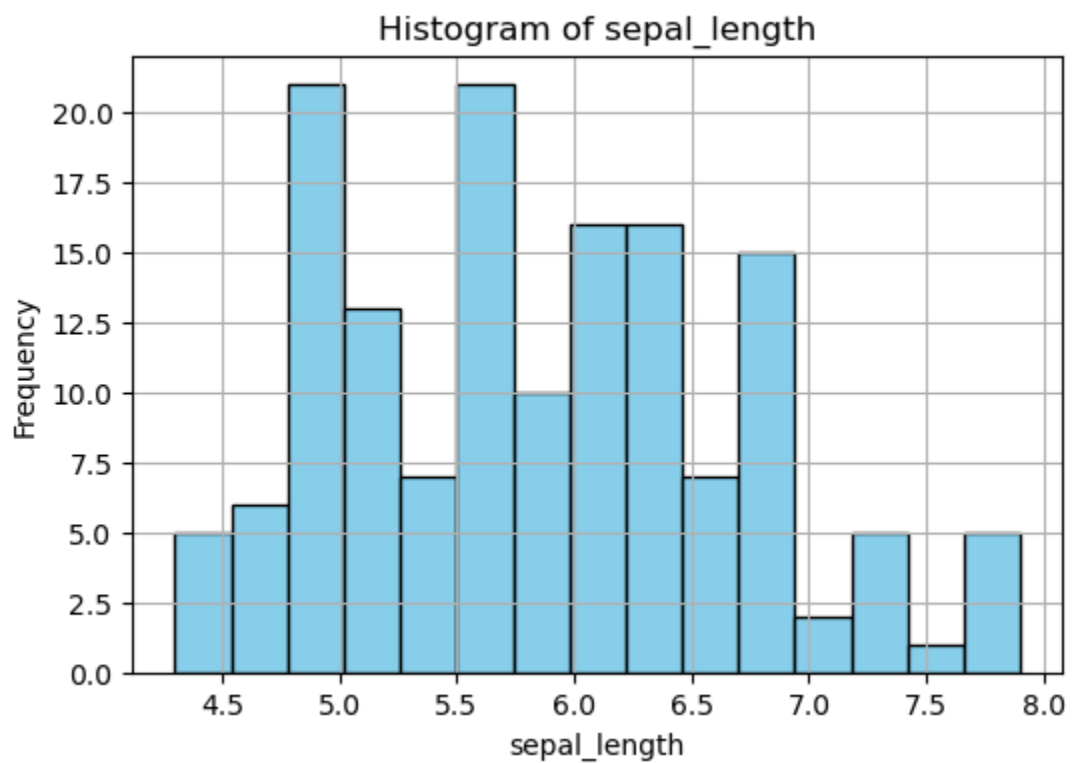
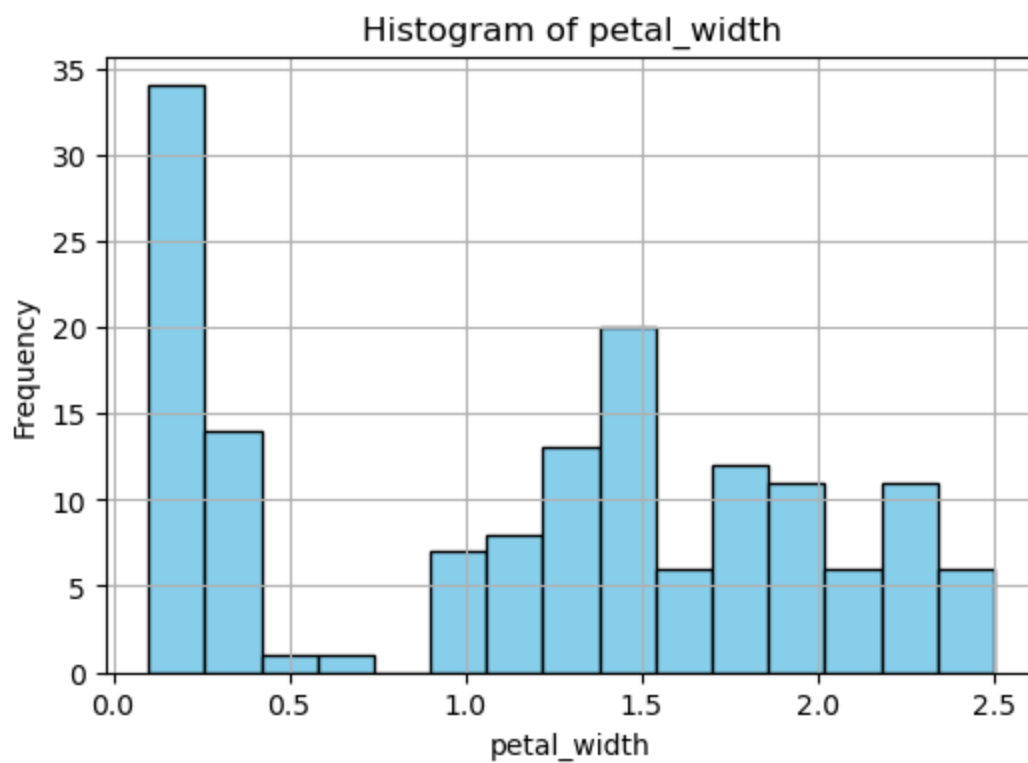4. Trực quan hóa lần lượt các thuộc tính dùng các dạng đồ thị histogram
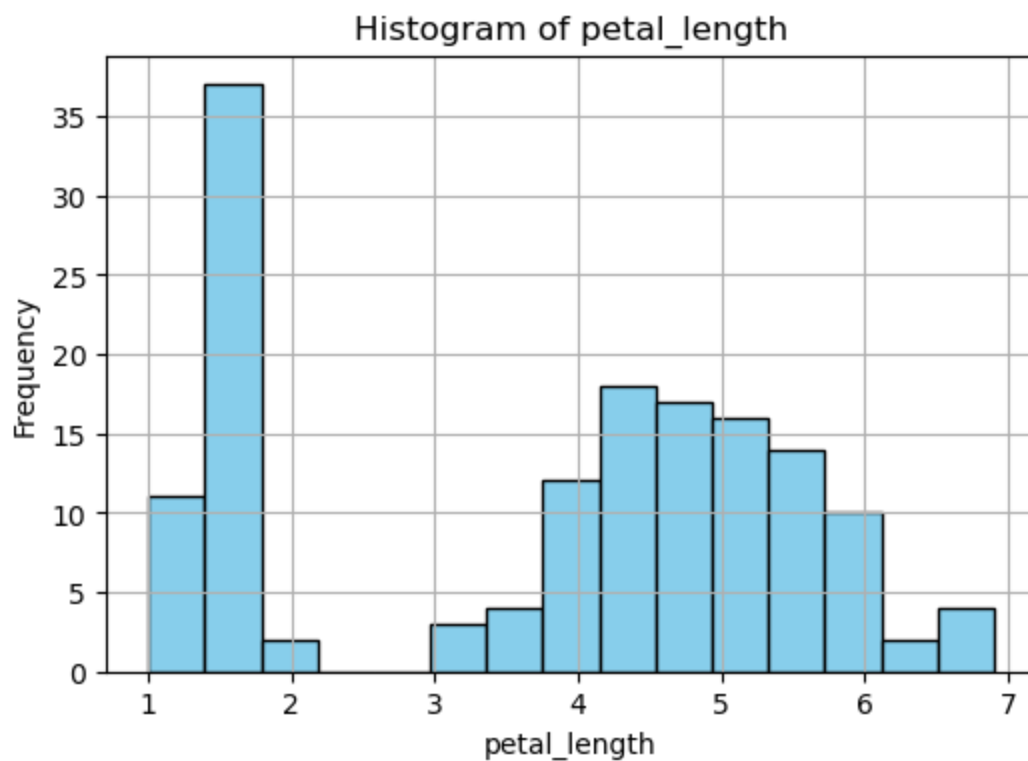
```python
In [12]: import pandas as pd
         import matplotlib.pyplot as plt

         # Đọc dữ liệu nê´u chưa có
         column_names = ["sepal_length", "sepal_width", "petal_length", "petal_width"
         df = pd.read_csv("iris.data", header=None, names=column_names)


         numeric_columns = ["sepal_length", "sepal_width", "petal_length", "petal_wid


         for col in numeric_columns:
             plt.figure(figsize=(6, 4))
             plt.hist(df[col], bins=15, edgecolor='black', color='skyblue')
             plt.title(f'Histogram of {col}')
             plt.xlabel(col)
             plt.ylabel('Frequency')
             plt.grid(True)
             plt.show()
```

Histogram of sepal_length

Histogram of sepal_width

Histogram of petal_length

Histogram of petal_width

In [ ]: