baithigiuaki-thaiquocbao

June 27, 2024

[127]:
```
import numpy as np
import pandas as pd
```

[128]:
```
#1
data = {
    'Name': ['Alice', 'Bob',␣
 ↪'Charlie','David','Eva','frank','Grace','Hannah','Ivan','Jack','Kelly','Liam','Mona','Nina'
    'Age': [25,30,35,28,22,45,34,31,27,29,33,40,26,32,36],
    'Salary':␣
 ↪[50000,60000,70000,55000,52000,80000,72000,68000,61000,59000,63000,77000,53000,66000,75000]
}

df = pd.DataFrame(data)

print(df)
print(df.columns)
print(df.index)
```

```
       Name  Age  Salary
0     Alice   25   50000
1       Bob   30   60000
2   Charlie   35   70000
3     David   28   55000
4       Eva   22   52000
5     frank   45   80000
6     Grace   34   72000
7    Hannah   31   68000
8      Ivan   27   61000
9      Jack   29   59000
10    Kelly   33   63000
11     Liam   40   77000
12     Mona   26   53000
13     Nina   32   66000
14    Oscar   36   75000
Index(['Name', 'Age', 'Salary'], dtype='object')
RangeIndex(start=0, stop=15, step=1)
```

[129]:
```
#2
df.head(15)
```

[129]:

	Name	Age	Salary
0	Alice	25	50000
1	Bob	30	60000
2	Charlie	35	70000
3	David	28	55000
4	Eva	22	52000
5	frank	45	80000
6	Grace	34	72000
7	Hannah	31	68000
8	Ivan	27	61000
9	Jack	29	59000
10	Kelly	33	63000
11	Liam	40	77000
12	Mona	26	53000
13	Nina	32	66000
14	Oscar	36	75000

[130]:
```
#3
age_df = df[df['Age'] > 28]
print(age_df)
```

	Name	Age	Salary
1	Bob	30	60000
2	Charlie	35	70000
5	frank	45	80000
6	Grace	34	72000
7	Hannah	31	68000
9	Jack	29	59000
10	Kelly	33	63000
11	Liam	40	77000
13	Nina	32	66000
14	Oscar	36	75000

[131]:
```
#4
average_salary = df['Salary'].mean()
print(average_salary)
```

```
64066.666666666664
```

[132]:
```
#5
group_df = df.groupby('Age')['Salary'].sum().reset_index()
print(group_df)
```

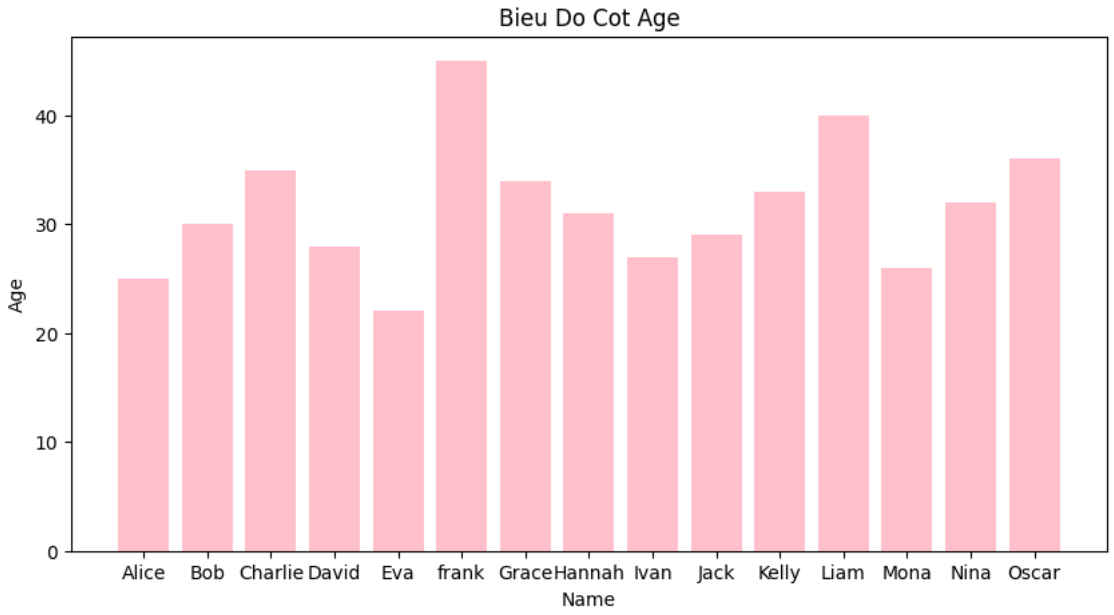
	Age	Salary
0	22	52000

```
1    25   50000
2    26   53000
3    27   61000
4    28   55000
5    29   59000
6    30   60000
7    31   68000
8    32   66000
9    33   63000
10   34   72000
11   35   70000
12   36   75000
13   40   77000
14   45   80000
```

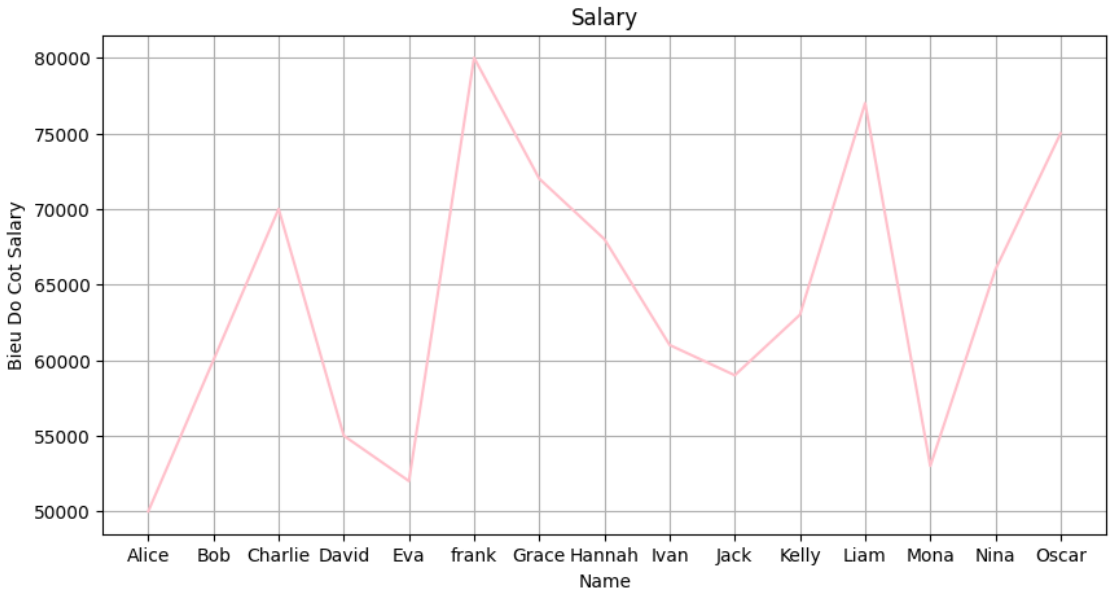
[133]:
```python
#6
df_salarylow = df.sort_values(by='Salary', ascending=False)
print(df_salarylow)
```

```
       Name  Age  Salary
5     frank   45   80000
11     Liam   40   77000
14    Oscar   36   75000
6     Grace   34   72000
2   Charlie   35   70000
7    Hannah   31   68000
13     Nina   32   66000
10    Kelly   33   63000
8      Ivan   27   61000
1       Bob   30   60000
9      Jack   29   59000
3     David   28   55000
12     Mona   26   53000
4       Eva   22   52000
0     Alice   25   50000
```

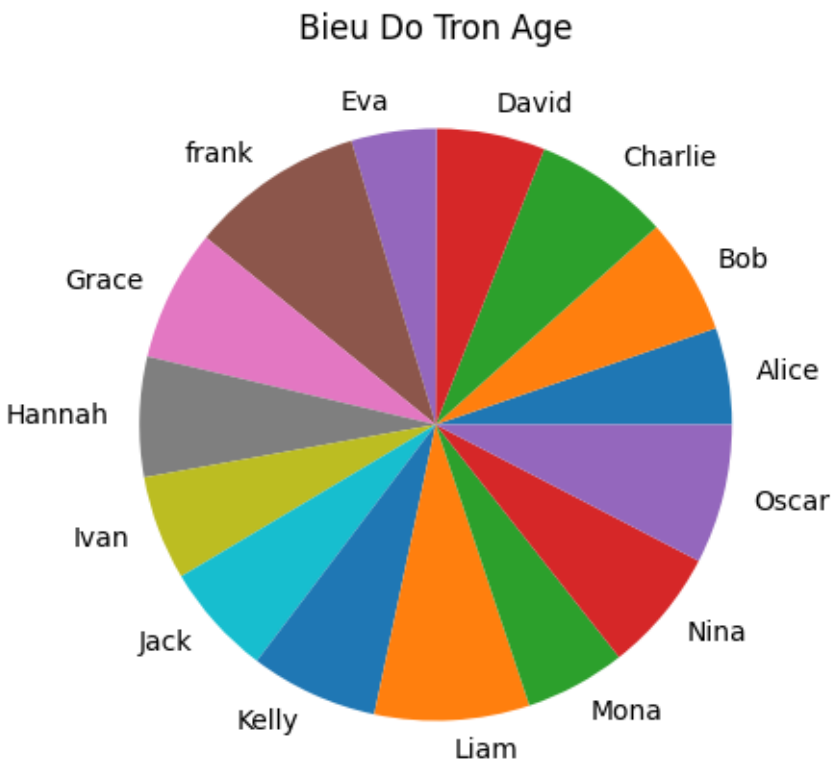
[134]:
```python
#7
import matplotlib.pyplot as plt
plt.figure(figsize=(10, 5))
plt.bar(df['Name'], df['Age'], color='pink')
plt.xlabel('Name')
plt.ylabel('Age')
plt.title('Bieu Do Cot Age')
plt.show()
```



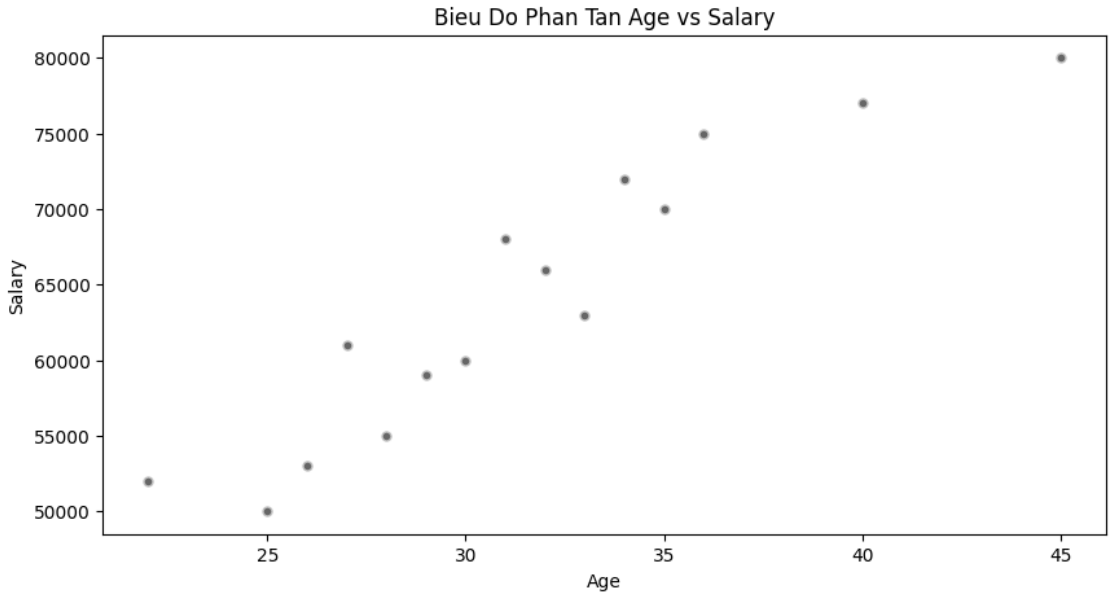
[135]:
```
#8
plt.figure(figsize=(10, 5))
plt.plot(df['Name'], df['Salary'], color = 'pink')
plt.title('Salary')
plt.xlabel('Name')
plt.ylabel('Bieu Do Cot Salary')
plt.grid(True)
plt.show()
```



[136]:
```
#9
plt.figure(figsize=(10, 5))
plt.pie(df['Age'], labels=df['Name'])
plt.title('Bieu Do Tron Age')
plt.show()
```



[137]:
```
#10
plt.figure(figsize=(10, 5))
plt.scatter(df['Age'], df['Salary'], color='black', alpha=0.6, edgecolors='w',␣
↪linewidth=2)
plt.xlabel('Age')
plt.ylabel('Salary')
plt.title('Bieu Do Phan Tan Age vs Salary')
plt.show()
```



[138]:
```
#11
dataframetest = df.isna().sum()
print(dataframetest)
```

```
Name      0
Age       0
Salary    0
dtype: int64
```

[139]:
```
#12
average_age = df['Age'].mean()
df.loc[df['Age'] > 30, 'Age'] = average_age
print(df)
```

```
       Name        Age  Salary
0     Alice  25.000000   50000
1       Bob  30.000000   60000
2   Charlie  31.533333   70000
3     David  28.000000   55000
4       Eva  22.000000   52000
5     frank  31.533333   80000
6     Grace  31.533333   72000
7    Hannah  31.533333   68000
8      Ivan  27.000000   61000
9      Jack  29.000000   59000
10    Kelly  31.533333   63000
11     Liam  31.533333   77000
12     Mona  26.000000   53000
```

```
13     Nina  31.533333   66000
14    Oscar  31.533333   75000
```

[140]:
```
#13
df['Age_normalize'] = (df['Age'] - df['Age'].min()) / (df['Age'].max() -␣
 ↪df['Age'].min())
print(df)
```

```
       Name        Age  Salary  Age_normalize
0     Alice  25.000000   50000       0.314685
1       Bob  30.000000   60000       0.839161
2   Charlie  31.533333   70000       1.000000
3     David  28.000000   55000       0.629371
4       Eva  22.000000   52000       0.000000
5     frank  31.533333   80000       1.000000
6     Grace  31.533333   72000       1.000000
7    Hannah  31.533333   68000       1.000000
8      Ivan  27.000000   61000       0.524476
9      Jack  29.000000   59000       0.734266
10    Kelly  31.533333   63000       1.000000
11     Liam  31.533333   77000       1.000000
12     Mona  26.000000   53000       0.419580
13     Nina  31.533333   66000       1.000000
14    Oscar  31.533333   75000       1.000000
```

[141]:
```
#14
def sapxep_age(age):
    if age <= 30:
        return 'young'
    elif 30 < age < 60:
        return 'middle_aged'
    else:
        return 'old'
df['age_group'] = df['Age'].apply(sapxep_age)
print(df)
```

```
       Name        Age  Salary  Age_normalize    age_group
0     Alice  25.000000   50000       0.314685        young
1       Bob  30.000000   60000       0.839161        young
2   Charlie  31.533333   70000       1.000000  middle_aged
3     David  28.000000   55000       0.629371        young
4       Eva  22.000000   52000       0.000000        young
5     frank  31.533333   80000       1.000000  middle_aged
6     Grace  31.533333   72000       1.000000  middle_aged
7    Hannah  31.533333   68000       1.000000  middle_aged
8      Ivan  27.000000   61000       0.524476        young
9      Jack  29.000000   59000       0.734266        young
10    Kelly  31.533333   63000       1.000000  middle_aged
```

```
11     Liam  31.533333   77000        1.000000  middle_aged
12     Mona  26.000000   53000        0.419580        young
13     Nina  31.533333   66000        1.000000  middle_aged
14    Oscar  31.533333   75000        1.000000  middle_aged
```

[142]:
```
#15
df['percentage_change_salary'] = df['Salary'].pct_change() * 100
print(df)
```

```
       Name        Age  Salary  Age_normalize    age_group  \
0     Alice  25.000000   50000       0.314685        young
1       Bob  30.000000   60000       0.839161        young
2   Charlie  31.533333   70000       1.000000  middle_aged
3     David  28.000000   55000       0.629371        young
4       Eva  22.000000   52000       0.000000        young
5     frank  31.533333   80000       1.000000  middle_aged
6     Grace  31.533333   72000       1.000000  middle_aged
7    Hannah  31.533333   68000       1.000000  middle_aged
8      Ivan  27.000000   61000       0.524476        young
9      Jack  29.000000   59000       0.734266        young
10    Kelly  31.533333   63000       1.000000  middle_aged
11     Liam  31.533333   77000       1.000000  middle_aged
12     Mona  26.000000   53000       0.419580        young
13     Nina  31.533333   66000       1.000000  middle_aged
14    Oscar  31.533333   75000       1.000000  middle_aged

    percentage_change_salary
0                        NaN
1                  20.000000
2                  16.666667
3                 -21.428571
4                  -5.454545
5                  53.846154
6                 -10.000000
7                  -5.555556
8                 -10.294118
9                  -3.278689
10                  6.779661
11                 22.222222
12                -31.168831
13                 24.528302
14                 13.636364
```

[143]:
```
#16
df.drop_duplicates(subset=['Name', 'Age', 'Salary'])
print(df)
```

```
       Name        Age  Salary  Age_normalize    age_group  \
```

```
0      Alice  25.000000   50000       0.314685        young
1        Bob  30.000000   60000       0.839161        young
2    Charlie  31.533333   70000       1.000000  middle_aged
3      David  28.000000   55000       0.629371        young
4        Eva  22.000000   52000       0.000000        young
5      frank  31.533333   80000       1.000000  middle_aged
6      Grace  31.533333   72000       1.000000  middle_aged
7     Hannah  31.533333   68000       1.000000  middle_aged
8       Ivan  27.000000   61000       0.524476        young
9       Jack  29.000000   59000       0.734266        young
10     Kelly  31.533333   63000       1.000000  middle_aged
11      Liam  31.533333   77000       1.000000  middle_aged
12      Mona  26.000000   53000       0.419580        young
13      Nina  31.533333   66000       1.000000  middle_aged
14     Oscar  31.533333   75000       1.000000  middle_aged
```

```
    percentage_change_salary
0                        NaN
1                  20.000000
2                  16.666667
3                 -21.428571
4                  -5.454545
5                  53.846154
6                 -10.000000
7                  -5.555556
8                 -10.294118
9                  -3.278689
10                  6.779661
11                 22.222222
12                -31.168831
13                 24.528302
14                 13.636364
```

[ ]:
```python
#17
df.to_csv('baikiemtraso1.csv', index=True)
```