Ex.No-2 PANDAS

#### AIM:

To analyse and study the best performance point of Reciprocating pumps using Pandas.

#### **PROCEDURE:**

#### 1. Dataset Creation:

Create a hypothetical dataset containing information about actual discharge (m3/s), input power (W), and output power (W).

# 2. Correlation Analysis:

Calculate the correlation matrix to examine the relationships between actual Discharge, input power, and output power using pandas'corr()' function.

# 3. Efficiency calculation:

Calculate the efficiency for each input value using the given formula: Efficiency(%)

= Output\_power/Input\_power \*100

#### 4. Head calculation:

Calculate the total head for each performance using the given formula : Head (m) =output\_power/actual discharge \*pg

### 5. Best Efficiency Point (BEP):

Identify the Best Efficiency Point of the reciprocating pump from

the efficiency by selecting the highest index values using the pandas' 'nlargest()'

function

### **PROGRAM:**

```
import pandas as pd data={
    'Actual Discharge':[40,50,60,70,80,90],
    'Input Power':[1,2,3,4,5,10],
    'Output Power':[70,30,90,100,140,170]
}
density=1000 gravity=9.81
a=pd.DataFrame(data)
a['Efficiency']=(a['Output Power']/a['Input Power'])*100
a['Head']=(a['Output Power']/a['Actual Discharge'])/(density*gravity) corr_matrix=a.corr()
print(corr_matrix)
max_efficiency=corr_matrix['Efficiency'].nlargest(2).iloc[1]
print("\nParameter with the highest correlation with efficiency=",max_efficiency)
```

### **OUTPUT:**

	Actual Discharge	Input Power	Output Power	Efficiency	1
Actual Discharge	1.000000	0.922018	0.901611	-0.614487	
Input Power	0.922018	1.000000	0.881684	-0.533271	
Output Power	0.901611	0.881684	1.000000	-0.227847	
Efficiency	-0.614487	-0.533271	-0.227847	1.000000	
Head	0.466245	0.489913	0.797480	0.391574	
	Head				
Actual Discharge	0.466245				
Input Power	0.489913				
Output Power	0.797480				
Efficiency	0.391574				
Head	1.000000				

Parameter with the highest correlation with efficiency= 0.3915744643953921

## **Result:**

The programs were run successfully