**1)**

**Solution**:

Let's start by loading the dataset and performing the necessary analysis:

**Code:**

import pandas as pd

import numpy as np

import seaborn as sns

import matplotlib.pyplot as plt

# Load the dataset

# Replace 'filename.csv' with the actual filename and path

df = pd.read\_csv('filename.csv')

**# Inspect the structure of the dataset**

print(df.head())

print(df.info())

**# 2. Identify high-range and low-range raw materials**

high\_range\_materials = df.groupby('Material')['Price'].max().sort\_values(ascending=False).head(5)

low\_range\_materials = df.groupby('Material')['Price'].min().sort\_values().head(5)

print("High-range raw materials:")

print(high\_range\_materials)

print("\nLow-range raw materials:")

print(low\_range\_materials)

**# 3. Calculate % change for each material over the years**

df['% Change'] = df.groupby('Material')['Price'].pct\_change() \* 100

**# 4. Determine the range of price changes over the years**

price\_change\_range = df.groupby('Material')['% Change'].agg(lambda x: x.max() - x.min())

print("\nRange of price changes over the years:")

print(price\_change\_range)

**# 5. Generate a heatmap to map the correlation between different raw materials**

correlation\_matrix = df.pivot\_table(index='Material', columns='Year', values='% Change', aggfunc='mean')

plt.figure(figsize=(10, 8))

sns.heatmap(correlation\_matrix, annot=True, cmap='coolwarm', fmt=".2f")

plt.title('Correlation Between Raw Materials')

plt.xlabel('Year')

plt.ylabel('Material')

plt.show()

```

In this script:

- We load the dataset and inspect its structure to understand its columns and values.

- We identify the high-range and low-range raw materials based on their maximum and minimum prices.

- We calculate the percentage change for each material over the years.

- We determine the range of price changes over the years by finding the difference between the maximum and minimum percentage change for each material.Top of Form

- We generate a heatmap to visualize the correlation between different raw materials' price changes over the years.