1.write a python program using pandas interpolation to fill in missing values in the data frame

Input:

df=pd.DataFrame({"math":[12,4,7,none,2],"english":[4,3,57,3,none],"hindi":[20,16,none,3,8],"science":[14,3,none,none,6]})

Code:

import pandas as pd

import numpy as np

from scipy.interpolate import interp1d

# Input DataFrame

df = pd.DataFrame({

"math": [12, 4, 7, None, 2],

"english": [4, 3, 57, 3, None],

"hindi": [20, 16, None, 3, 8],

"science": [14, 3, None, None, 6]

})

# Interpolate missing values using scipy and pandas

for column in df.columns:

valid\_idx = np.where(~df[column].isna())[0]

interp\_func = interp1d(valid\_idx, df[column].dropna(), fill\_value='extrapolate')

df[column] = interp\_func(np.arange(len(df[column])))

print(df)

Output:

math english hindi science

0 12.0 4.0 20.0 14.0

1 4.0 3.0 16.0 3.0

2 7.0 57.0 9.5 4.0

3 4.5 3.0 3.0 5.0

4 2.0 -51.0 8.0 6.0

2.write a python program using interpolation to fill in missing values in the data frame.the generate a subject wise highest score in the form of a bar chart.

input:

data={'subject':['math','physics','chemistry','biology'],'student\_A':[80,85,np.nan.70],'student\_B':[90,np.nan,75,85],'student\_C:[80,88,np.nan,78]}

Code:

import pandas as pd

import numpy as np

from scipy.interpolate import interp1d

import matplotlib.pyplot as plt

# Input DataFrame

data = {

'subject': ['math', 'physics', 'chemistry', 'biology'],

'student\_A': [80, 85, np.nan, 70],

'student\_B': [90, np.nan, 75, 85],

'student\_C': [80, 88, np.nan, 78]

}

df = pd.DataFrame(data)

# Set 'subject' as index

df.set\_index('subject', inplace=True)

# Interpolate missing values using scipy

for column in df.columns:

valid\_idx = np.where(~df[column].isna())[0]

interp\_func = interp1d(valid\_idx, df[column].dropna(), fill\_value='extrapolate')

df[column] = interp\_func(np.arange(len(df[column])))

# Find the highest score for each subject

highest\_scores = df.max(axis=1)

# Plot the highest scores as a bar chart

plt.figure(figsize=(5, 5))

highest\_scores.plot(kind='bar', color='skyblue')

plt.title('Highest Scores by Subject')

plt.xlabel('Subject')

plt.ylabel('Highest Score')

plt.xticks(rotation=0)

plt.show()

Output:

