

Name : Eadala Sumanvitha

Scholarno : 201112014

Section : CSE 1

Semester : VI

Data Warehousing & Mining Lab Assignment 3

Question:

Write a program to perform data reduction using wavelet (Haar) transformation on input given by user. Also extend same program to perform inverse wavelet transform.

- a. First take input from user
- b. Apply wavelet transform
- c. Print transformed data
- d. Ask user to decide threshold
- e. Apply inverse wavelet transform
- f. Plot original data, transformed data and reconstructed data on same plot to observe the changes

Make this program in generalized way that it will take input of variable size.

```

n=int(input())
l=[]
for i in range(0,n):
    x=int(input())
    l.append(x)

print(l)

8
56
40
8
24
48
48
40
16
[56, 40, 8, 24, 48, 48, 40, 16]

```

```

length = len(l)
l1=[]
l1=l.copy()
l3=l.copy()
print(l1)

[56, 40, 8, 24, 48, 48, 40, 16]

```

```

while length >= 2:
    l2=l1.copy()
    k=0
    y=0
    for i in range(0,len(l1)):
        if i < len(l2)//2:
            l1[i]=(l2[k]+l2[k+1])//2
            k=k+2
        elif i >= len(l2)//2:
            l1[i]=l2[y]-l1[i-len(l2)//2]
            y=y+2
    l3[0:length]=l1
    length=length//2
    l1=l1[0:length]
print('Original data:')
print(l)
print('Transformed data:')
print(l3)

```

```

Original data:
[56, 40, 8, 24, 48, 48, 40, 16]
Transformed data:
[35, -3, 16, 10, 8, -8, 0, 12]

```

```

threshold = int(input())
print(threshold)

```

```

3
3

```

```

l5=l3.copy()
l6=l3.copy()
l7=l3.copy()
ans=[]
print(l5)

[35, -3, 16, 10, 8, -8, 0, 12]

```

```

def inverse_wavelet(l5,l6,l7):
    length1=2
    while length1 <= len(l):
        k=0
        for i in range(0,length1//2):

```

```

15[k]=16[i]+16[length1//2 + i]
15[k+1]=16[i]-16[length1//2 + i]
k=k+2
16=15.copy()
length1=2*length1

```

```

inverse_wavelet(15,16,17)
print('Transformed data:')
print(17)
print('Reconstructed data:')
print(15)

```

```

Transformed data:
[35, -3, 16, 10, 8, -8, 0, 12]
Reconstructed data:
[56, 40, 8, 24, 48, 48, 40, 16]

```

```

trans_1 = 17.copy()
print(trans_1)

[35, -3, 16, 10, 8, -8, 0, 12]

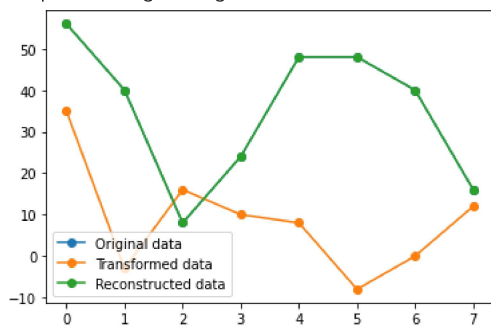
```

```

import matplotlib.pyplot as plt
import numpy as np
y1 = np.array(1)
y2 = np.array(trans_1)
y3 = np.array(15)
plt.plot(y1,marker='o',label = 'Original data')
plt.plot(y2,marker='o',label = 'Transformed data')
plt.plot(y3,marker='o',label = 'Reconstructed data')
plt.legend()

```

<matplotlib.legend.Legend at 0x7ff779591f40>



```

for i in range(0,len(17)):
    if 17[i] < 3:
        17[i]=0

```

```

print(17)

[35, 0, 16, 10, 8, 0, 0, 12]

```

```

18=17.copy()
19=17.copy()
110=17.copy()

```

```
inverse_wavelet(17,19,110)
```

```

print('Original data:')
print(1)
print('Transformed data by wavelet transform:')
print(trans_1)
print('Reconstructed data after applying threshold:')
print(17)

```

```

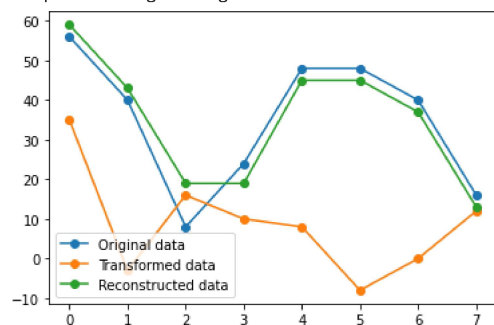
Original data:
[56, 40, 8, 24, 48, 48, 40, 16]
Transformed data by wavelet transform:
[35, -3, 16, 10, 8, -8, 0, 12]

```

Reconstructed data after applying threshold:
[59, 43, 19, 19, 45, 45, 37, 13]

```
import matplotlib.pyplot as plt
import numpy as np
y1 = np.array(1)
y2 = np.array(trans_1)
y3 = np.array(17)
plt.plot(y1,marker='o',label = 'Original data')
plt.plot(y2,marker='o',label = 'Transformed data')
plt.plot(y3,marker='o',label = 'Reconstructed data')
plt.legend()
```

<matplotlib.legend.Legend at 0x7ff779505a60>



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