Experiment No.4: Discrete Fourier Transform

In [ ]:
```
'''
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Date: 05/08/2023
Time: 14:00
'''
```

Problem Statement: Write a code to implement DFT & IDFT using Formula Method.

In [2]:
```
#Importing Python Libraries
import numpy as np
import matplotlib.pyplot as plt
```

In [44]:
```
#Getting user-defined inputs
x = eval(input("Enter input sequence x[n]= "))
L = len(x)
print("Length of x[n] = ",L)
N = 4
N = int(N)
```

```
Enter input sequence x[n]= [1+1j,2+2j,3+3j,4+4j]
Length of x[n] =  4
```

In [45]:
```
#Callable Function for DFT
X = np.zeros(N,complex)
def DFT_TEA (x,N):
    for k in range(N):
        for n in range(N):
            X[k]+= x[n] * np.exp((-2j * np.pi * n * k)/N)
    return(X)
```

In [46]:
```
#Calling DFT Function
X = np.zeros(N,complex)
if N < L:
    print("DFT cannot be computed")
else:
    X = np.round(DFT_TEA(x,N),decimals = 2)

    print(X)
```

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[10.+10.j -4. -0.j -2. -2.j  0. -4.j]
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In [ ]:
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