

## Experiment No.4: Discrete Fourier Transform

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In [ ]: ...
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Date: 05/08/2023
Time: 14:00
...
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Problem Statement: Write a code to implement DFT & IDFT using Formula Method.

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In [2]: #Importing Python Libraries
import numpy as np
import matplotlib.pyplot as plt
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In [41]: #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]= [0+1j,0+2j,0+3j,0-1j]  
Length of x[n] = 4

```
In [42]: #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 [43]: #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)
```

[ 0.+5.j 3.-2.j -0.+3.j -3.-2.j]

```
In [ ]:
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