

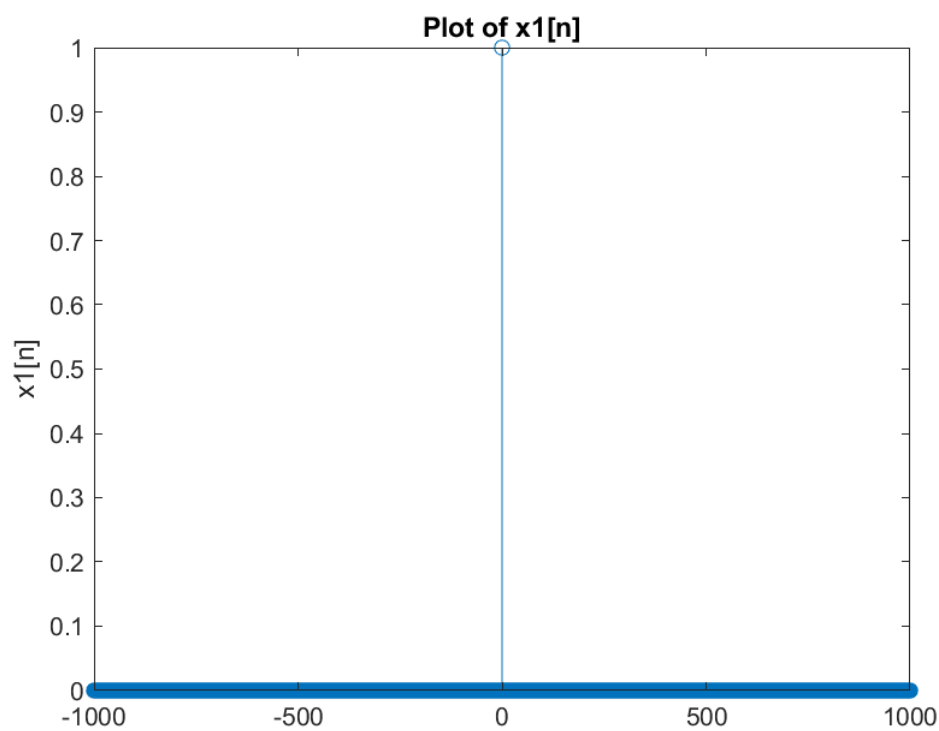
ASSIGNMENT-3

Aakarsh Jain

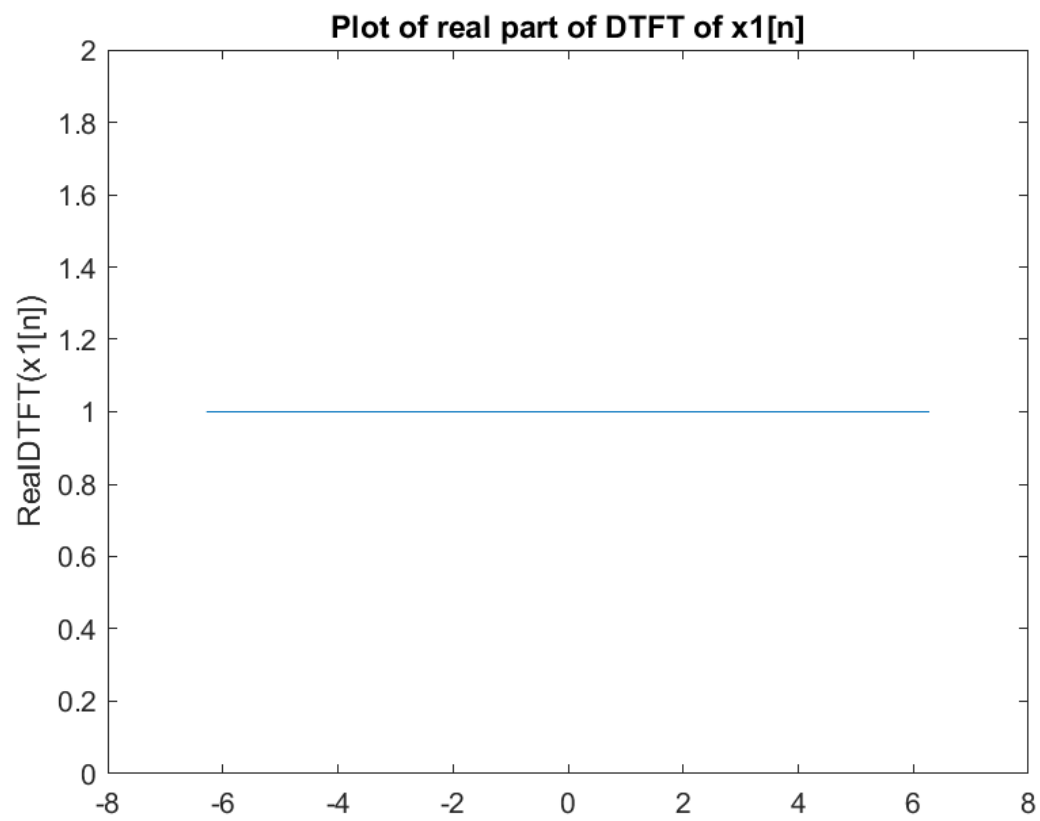
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Question - 1

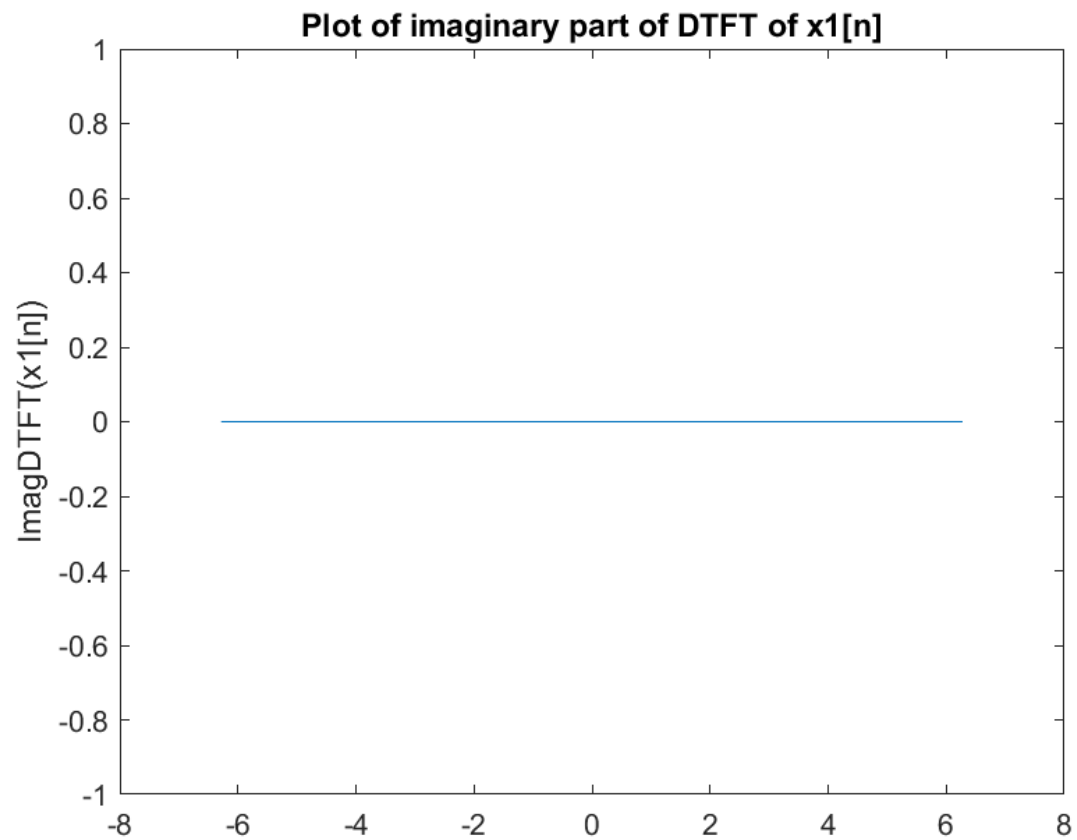
(a) The graph generated for $x_1[n]$ is as follows:-



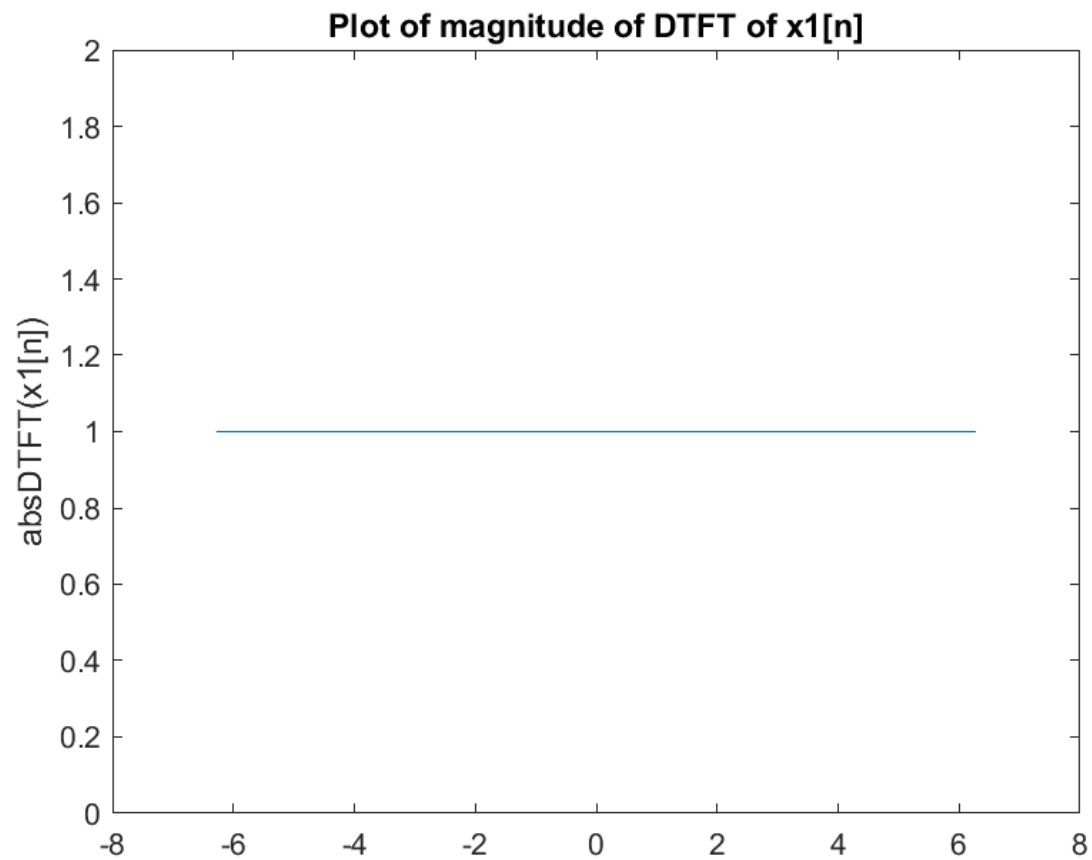
The graph generated for real part of DTFT of $x_1[n]$ is as follows:-



The graph generated for imaginary part of DTFT of $x_1[n]$ is as follows:-

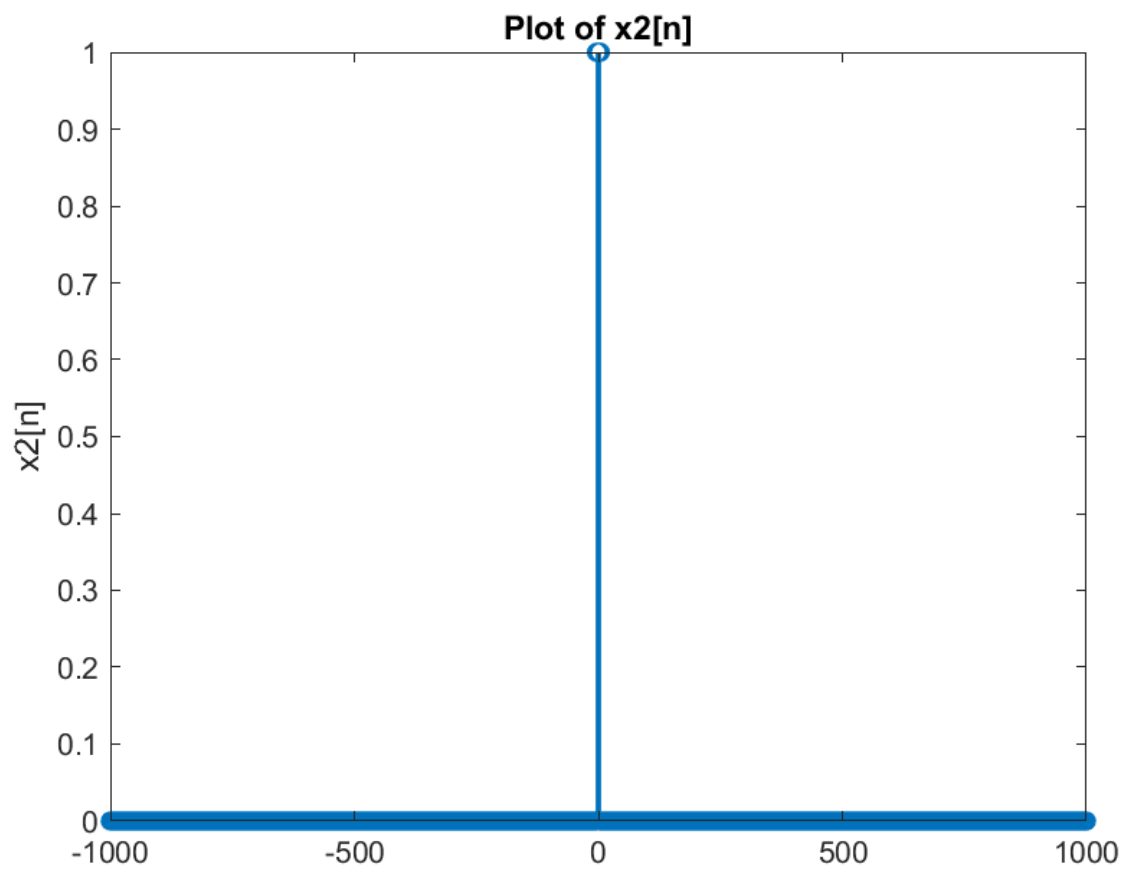


The graph generated for absolute value of DTFT of $x_1[n]$ is as follows:-

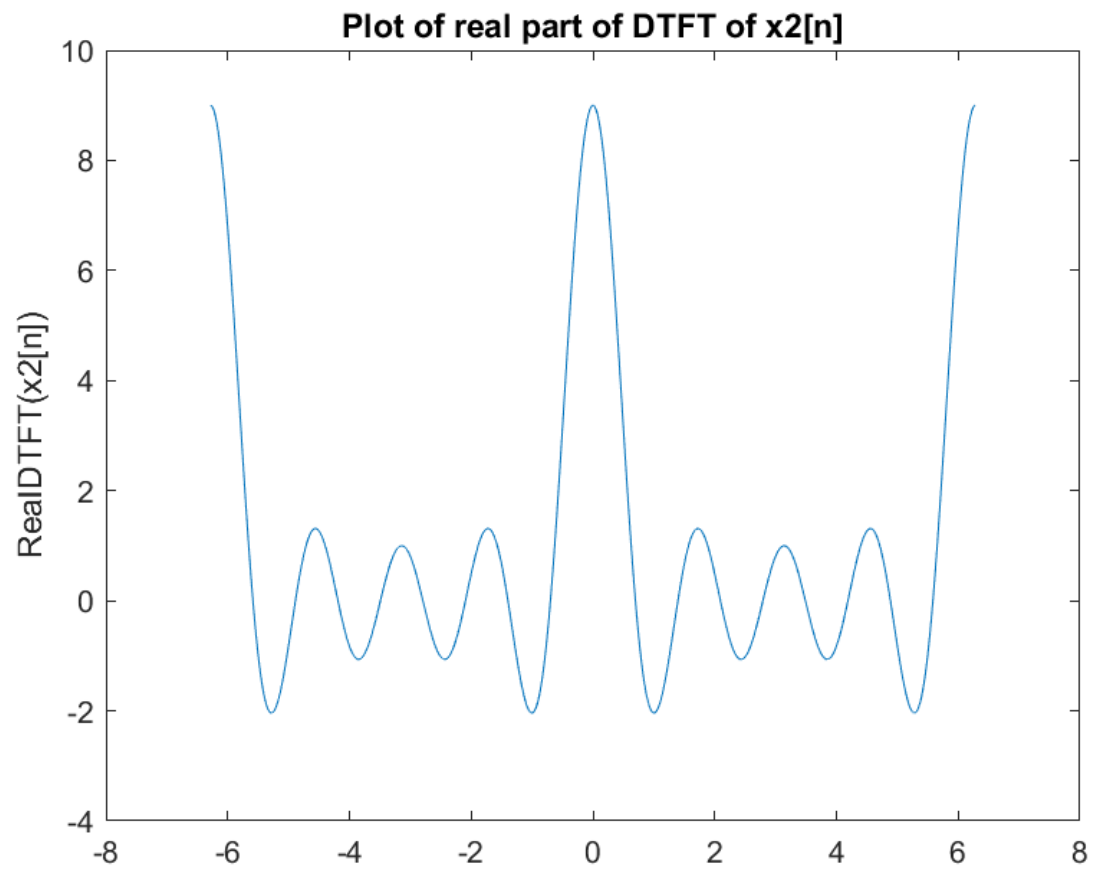


The DTFT is constant for all values of w and has real part equal to 1 and imaginary part equal to 0. Thus the result is trivially periodic.

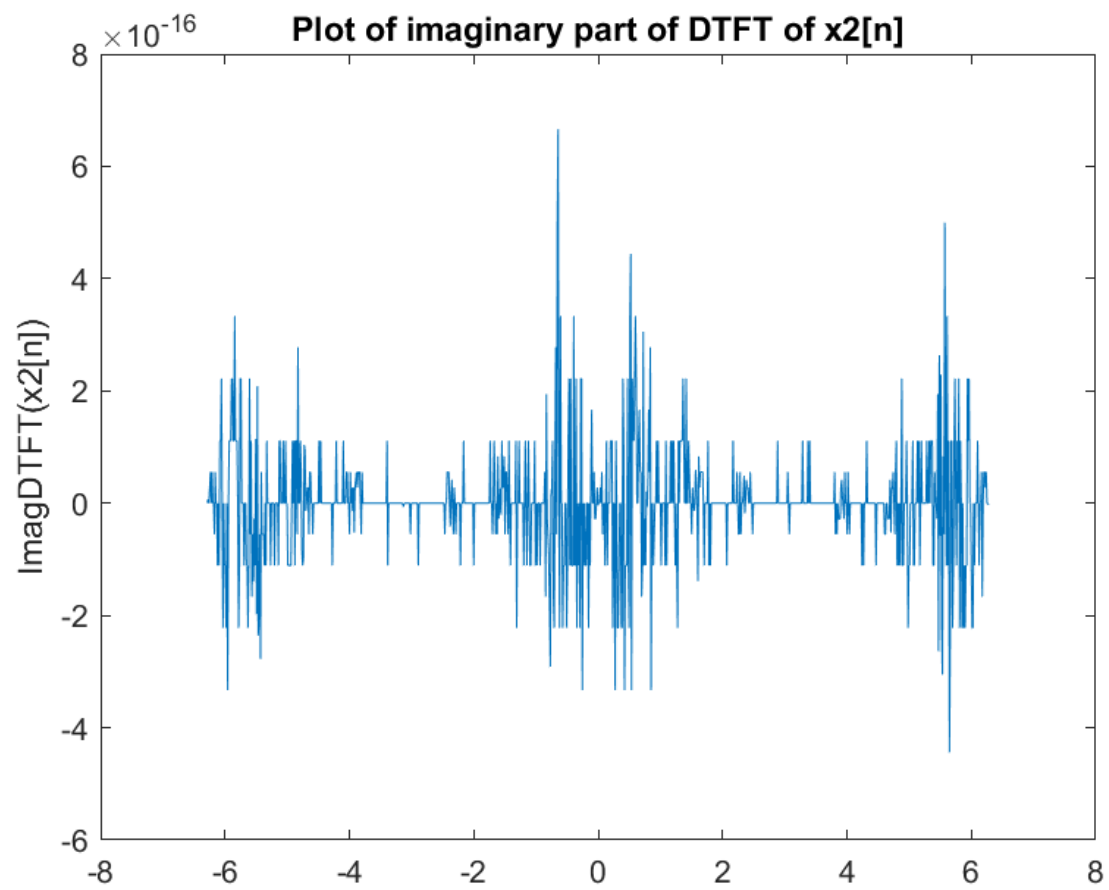
(b) The graph generated for $x_2[n]$ is as follows:-



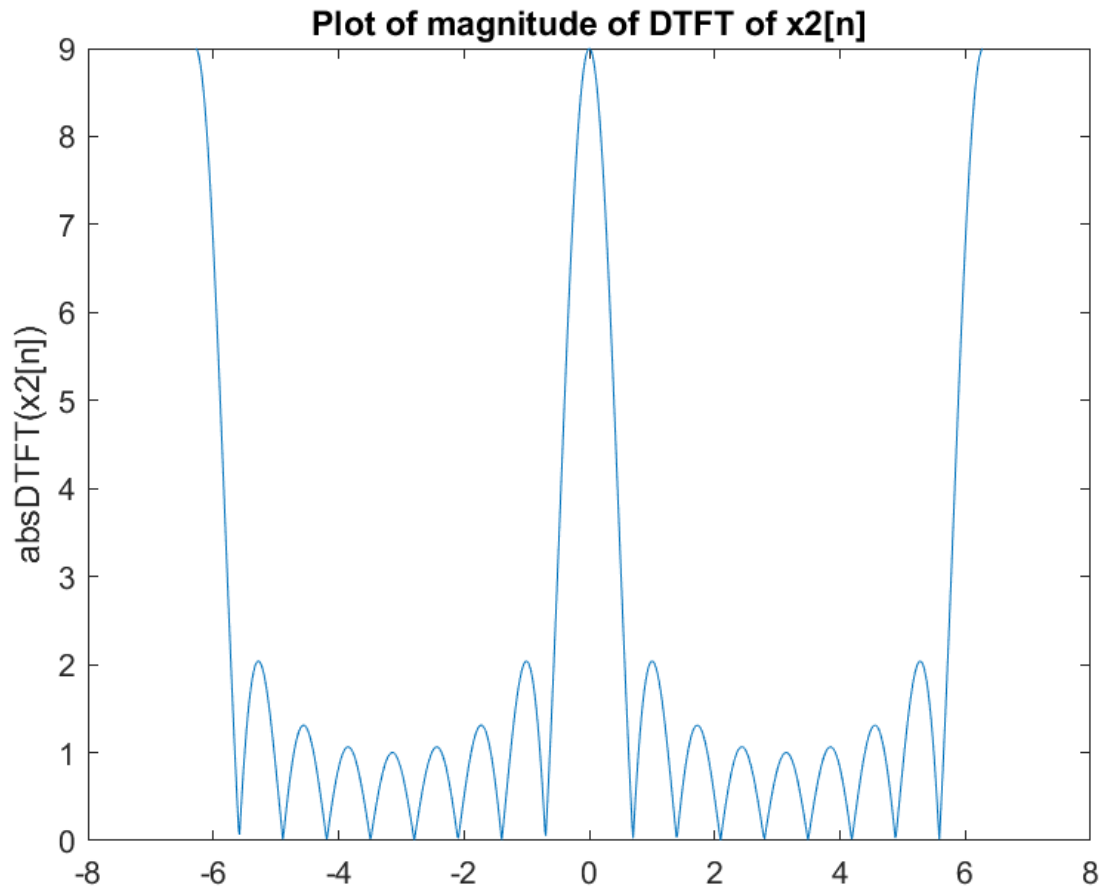
The graph for real part of DTFT $x_2[n]$ is as follows:



The graph for imaginary part of DTFT $x_2[n]$ is as follows:



The graph for absolute value of DTFT $x_2[n]$ is as follows:



Thus we can see that the DTFT is periodic with period of 2π .

Code execution:

I have written all the functions used to modify signals, i.e. x_1 , x_2 and x_trans1 , x_trans2 in separate .m files. The a.m and b.m files are supposed to use these functions and calculate the DTFT. Hence, all the files should be in the current working directory during execution and only main.m needs to be executed.

