MARKS:

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

Data Communication Laboratory

LAB REPORT

ON

Introduction to MATLAB.

Experiment No: 1

Section: [G]

Semester: Spring 20-21

Course Teacher: MD MEHEDI HASAN

Date of Performance: 26-Jan-21

Date of Submission: 9-Feb-21

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Student ID: 19-40158-1

Performance Task:

My ID = **19-40158-1**

Here,

A= 1, B= 9, C= 4, D= 0, E= 1, F= 5, G= 8, H= 1.

$x_1(t) = A_1 \cos(2\pi(\text{CDEF})t + j_1)$

here, $\boldsymbol{x_1(t) = A_1 \cos(2\pi(4015)t + j_1)}$

$x_2(t) = A_2 \cos(2\pi(\text{CDEF})t + j_2)$

here, $\boldsymbol{x_2(t) = A_2 \cos(2\pi(4015)t + j_2)}$

(a) Select the value of the amplitudes as follows: let A1 = AB and A2 = GH. For the phases, use j1 = DG (in degrees), and take j2 = 30º. When doing computations in Matlab, make sure to convert degrees to radians

Ans:

A1=AB=19 deg
A2=GH=81 deg

j1 = DG=08 deg *pi/180=0.139 rad

j2 = 30 deg*pi/180 = 0.52359 rad

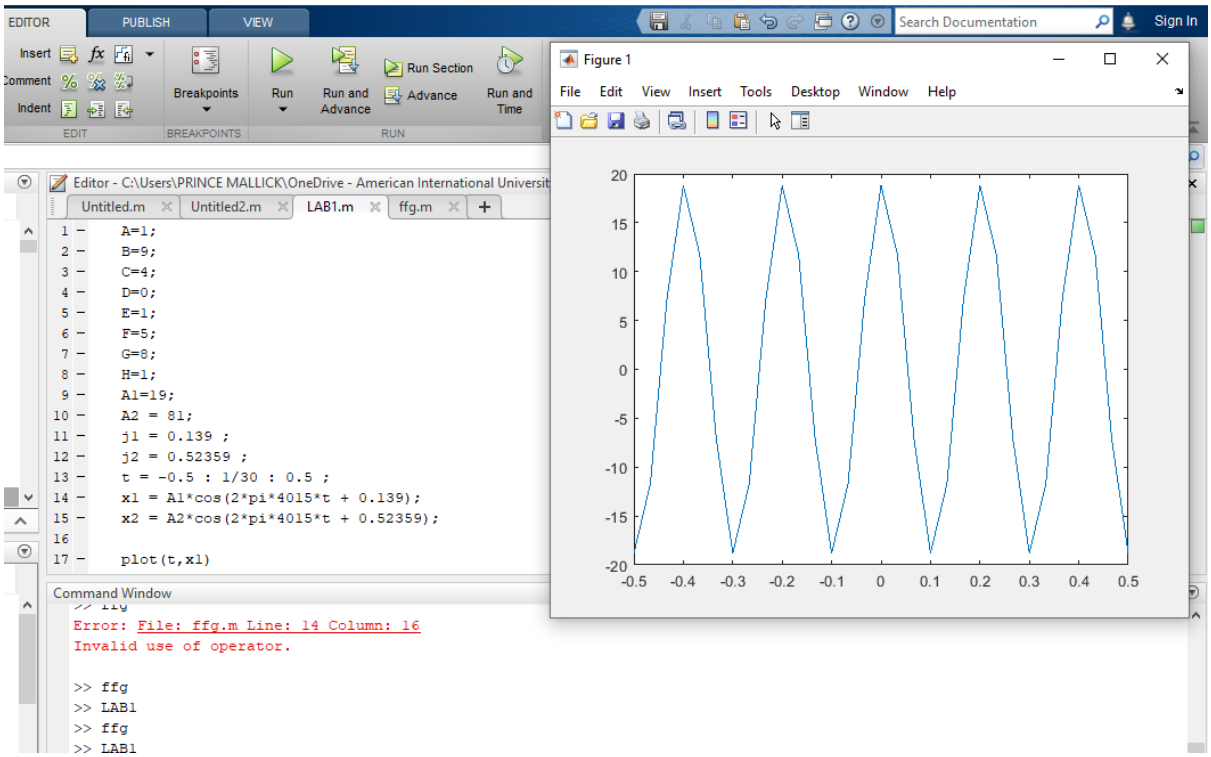
Now,

$\boldsymbol{x_1(t) = A_1 \cos(2\pi(4015)t + j_1)}$
$\boldsymbol{x_1(t) = 19 \cos(2\pi(4015)t + 0.139)}$

$\boldsymbol{x_2(t) = A_2 \cos(2\pi(4015)t + j_2)}$

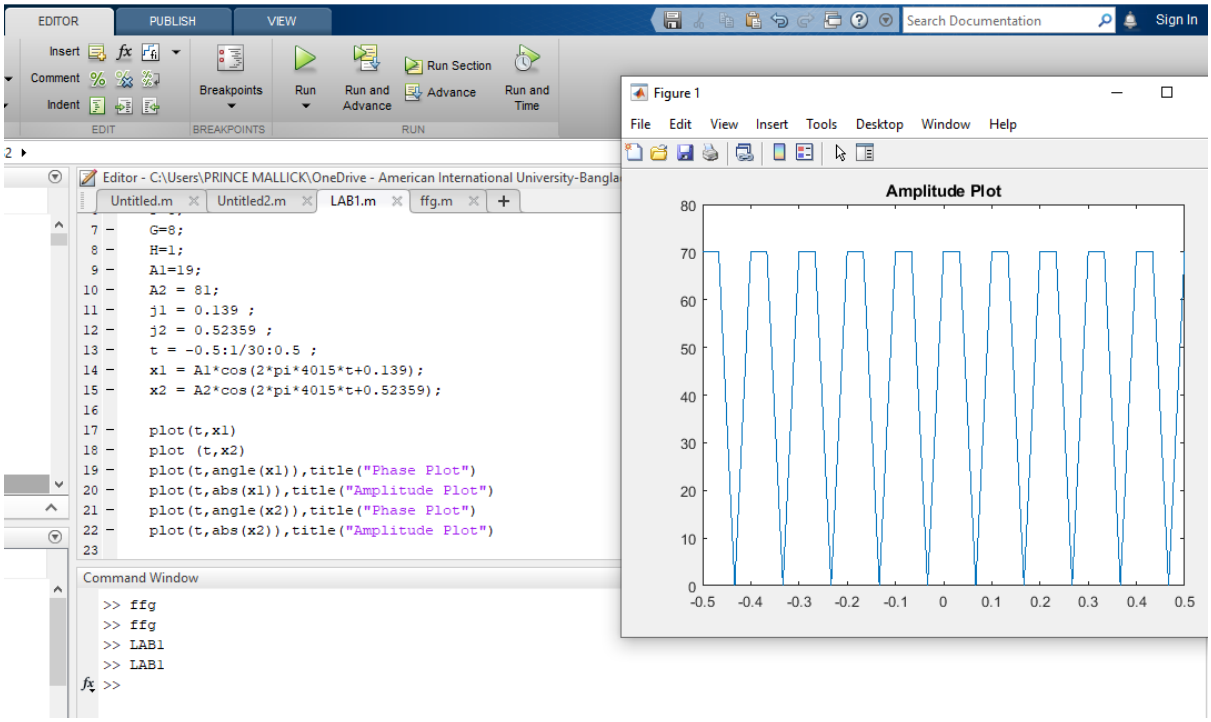
$\boldsymbol{x_2(t) = 81 \cos(2\pi(4015)t +} 0.52359\boldsymbol{)}$

(b) Make a plot of both signals over a range of t that will exhibit approximately 3 cycles. Make sure the plot starts at a negative time so that it will include t = 0, and make sure that you have at least 20 samples per period of the wave.

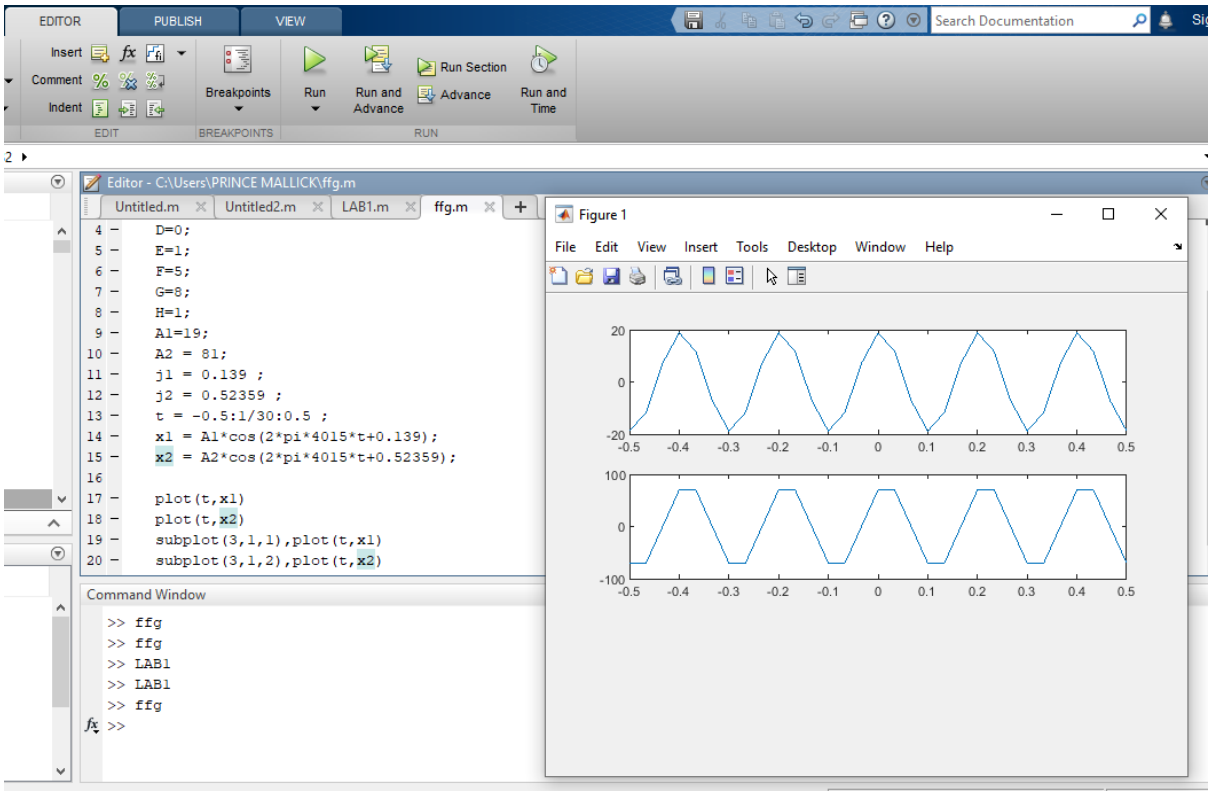


(c) Verify that the phase of the two signals x1(t) and x2(t) is correct at t = 0, and also verify that each one has the correct maximum amplitude

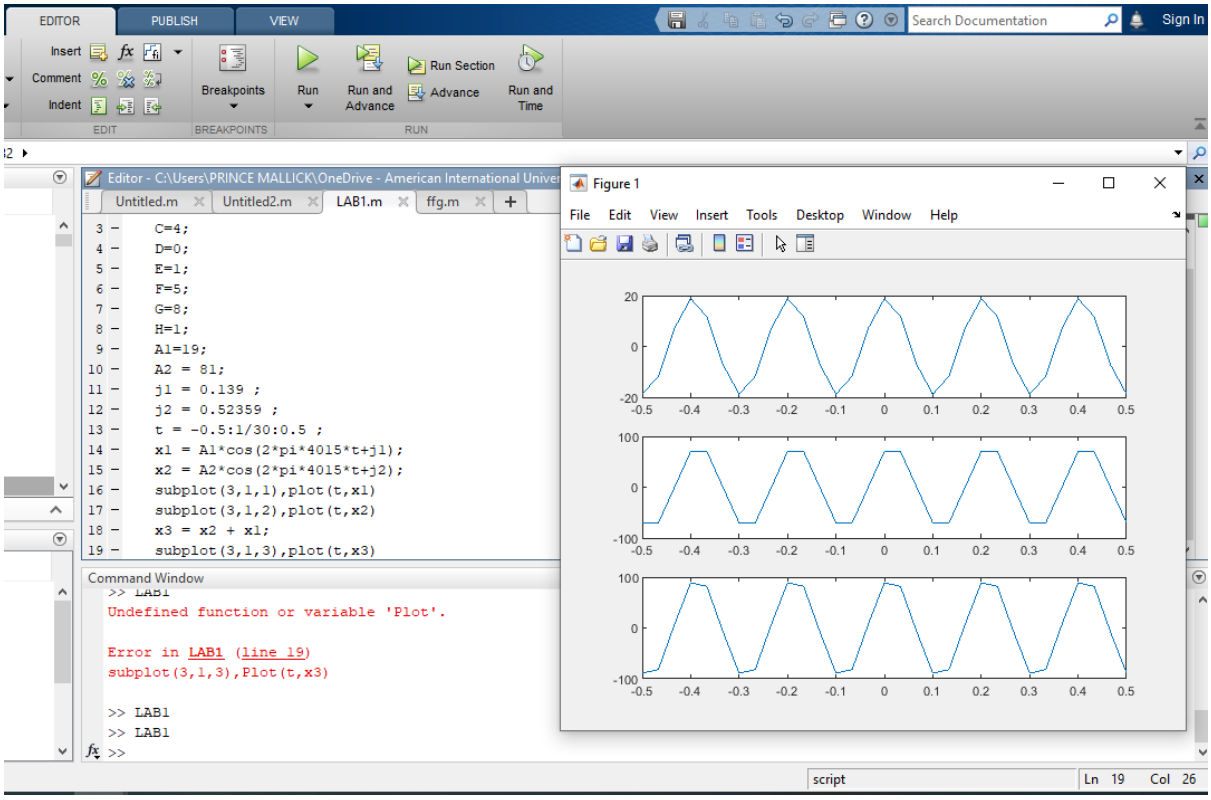
Ans:



(d) Use subplot(3,1,1) and subplot(3,1,2) to make a three-panel subplot that puts both of these plots on the same window. See help subplot



(e) Create a third sinusoid as the sum: x3(t) = x1(t) + x2(t). In Matlab this amounts to summing the vectors that hold the samples of each sinusoid. Make a plot of x3 (t) over the same range of time as used in the previous two plots. Include this as the third panel in the window by using subplot (3,1,3).



(f) Measure the magnitude and phase of x3 (t) directly from the plot. In your lab report, explain how the magnitude and phase were measured by making annotations on each of the plots