**MAT1011 – Calculus for Engineers (MATLAB), Fall Semester 2020-2021**

**Digital Assignment SL. 2, Experiment – 1B: Maxima and Minima of a function of one variable**

**By: Jonathan Rufus Samuel (20BCT0332) Date: 17.12.2020**

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(Note: Reason for late submission – Ma’am, I had joined classes on the 16th of November and was unaware of the format for submission. Hence I had submitted a handwritten answer for the first 2 assignments, scheduled for submission on the 18th of November. This is the finished copy including the MatLab program for the given question. Thanking You.)

**Q1) Evaluate and visualize the local extrema of the function x^3 - 12\*x - 5 on the interval (-4,4).**

A: Code is as follows:

%Evaluate and visualize the local extrema of the function

% x^3 - 12\*x - 5 on the interval (-4,4).

clear

clc

syms x

f(x)=x^3-12\*x-5;

I=[-4,4];

f1(x)=-f(x);

a=I(1);b=I(2);

t=linspace(a,b,10000); %Discretizing the interval I

g=double(f(t)); %Finding the values of f(x) at t values

[lmax\_f,loc]=findpeaks(g);

lmax\_x=round(t(loc),4);

h=double(f1(t));

[lmin\_f,loc]=findpeaks(h);

lmin\_x=round(t(loc),4);

disp('Local maximum occur at x=')

disp(lmax\_x)

disp('The Local Maximum value(s) of the function are ')

disp(double(f(lmax\_x)))

disp('Local minimum occur at x=')

disp(lmin\_x)

disp('The Local Minimum value(s) of the function are ')

disp(double(f(lmin\_x)))

plot(t,f(t));hold on; %Plotting the function

plot(lmax\_x,double(f(lmax\_x)),'or');%Pointing the local

% maxima on the curve of f(x)

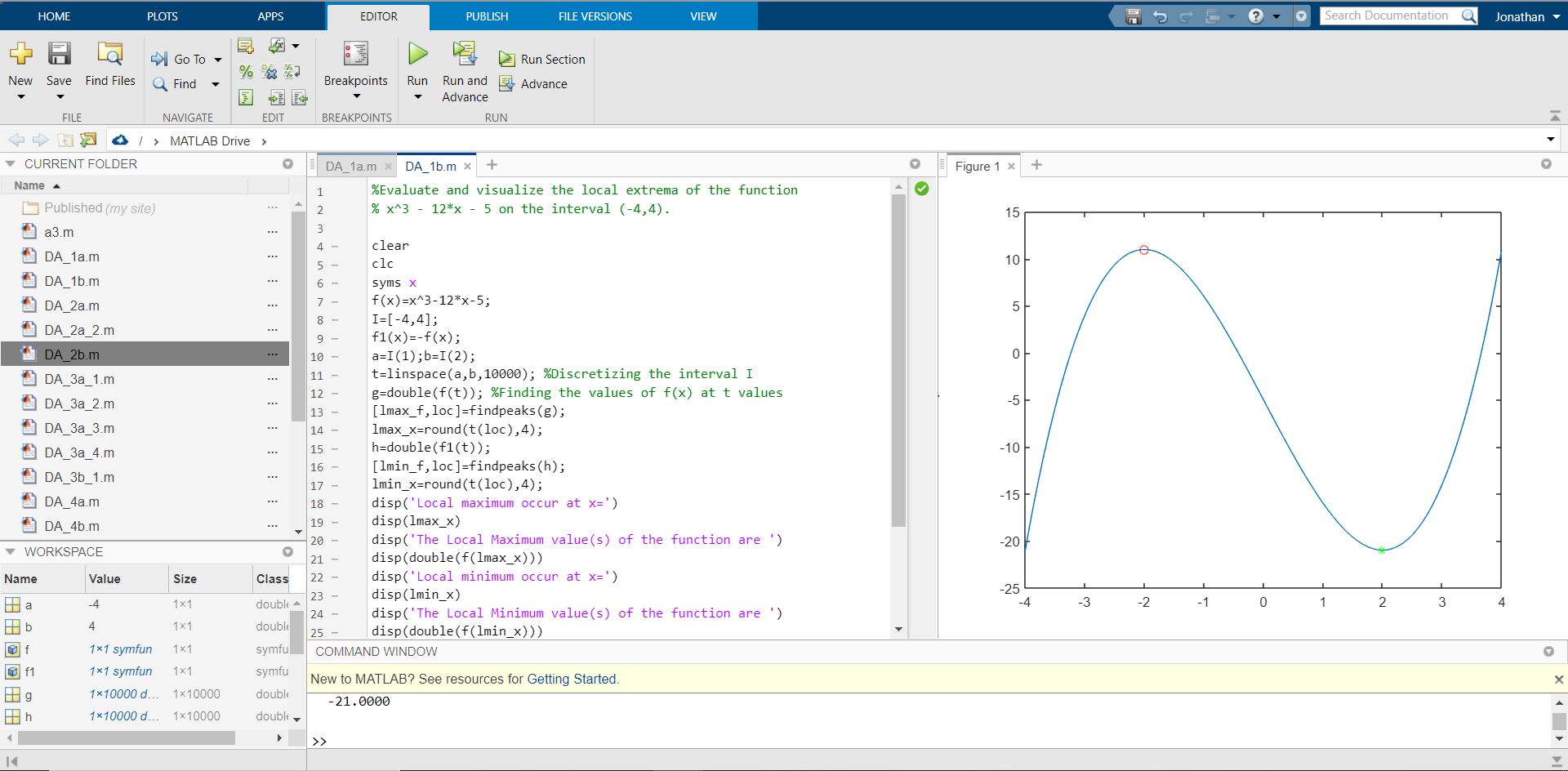
plot(lmin\_x,double(f(lmin\_x)),'\*g');%Pointing the local

% minima on the curve of f(x)

hold off

**Output (via Command Window):**

Local maximum occur at x=  
 -1.9998  
  
The Local Maximum value(s) of the function are   
 11.0000  
  
Local minimum occur at x=  
 1.9998  
  
The Local Minimum value(s) of the function are   
 -21.0000



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