

Lab1_Question 1:

Solve the following Ordinary differential equation (ODE) using Shooting Method ?

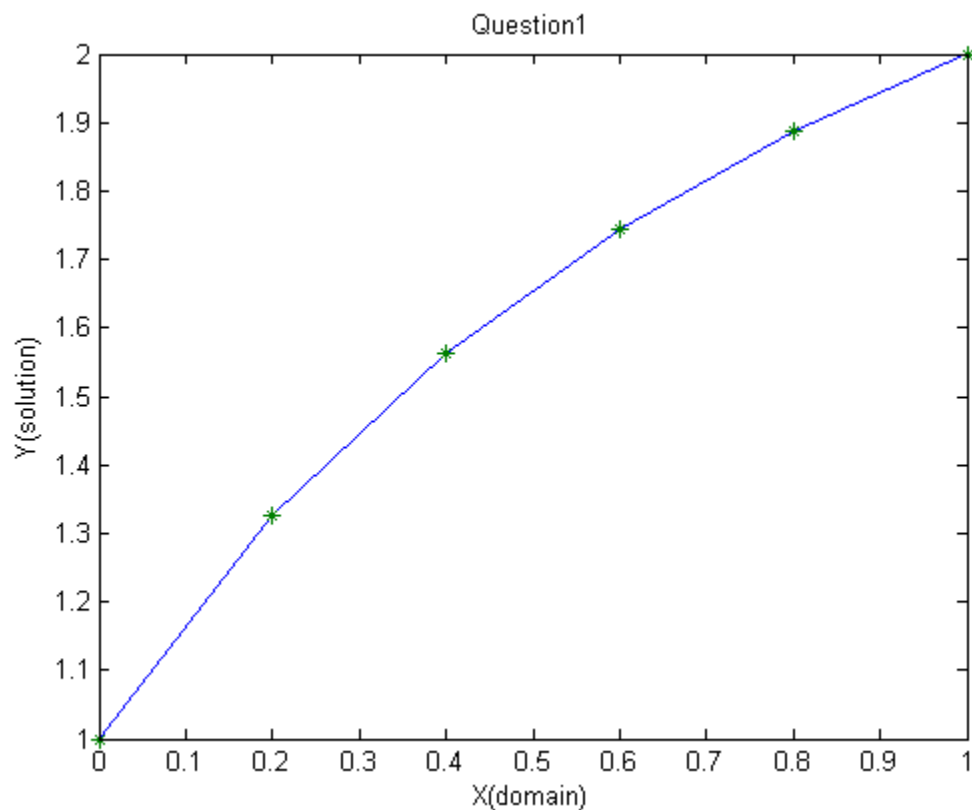
$$yy'' + 1 + (y')^2 = 0$$

Given -: $y(0) = 1$, $y(1) = 2$

Choose $a_0 = 0.5$, $a_1 = 1.0$, $h = 0.2$.

Solution -: The value of alpha is **2.00582**

X	0	0.2	0.4	0.6	0.8	1.0
Y	1.0	1.3263	1.5618	1.7434	1.8867	2.0
Y'	2.0058	1.3579	1.0249	0.8034	0.6363	0.500



Lab1_Question 2:

Solve the following Ordinary differential equation (ODE) using Shooting Method ?

$$y'' - y = 0$$

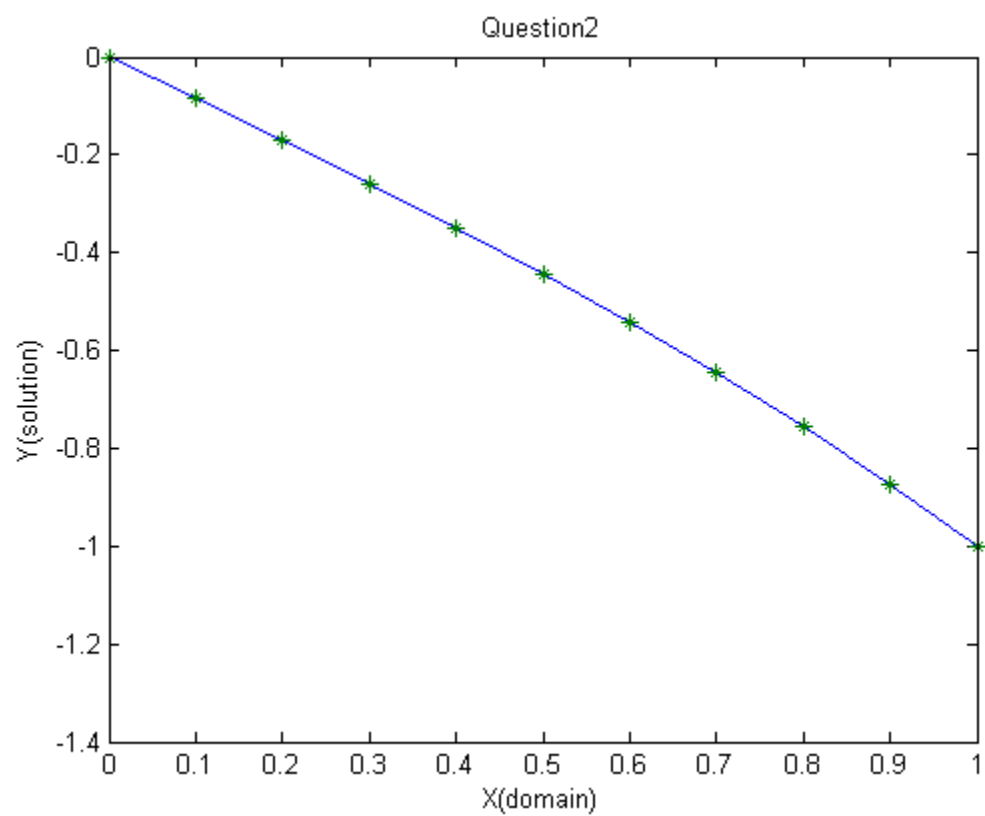
Given -: $y(0) = 0$, $y(1) = -1$

Choose $a_0 = 0.3$, $a_1 = 0.4$, $h = 0.1$

Solution-: The value of alpha is **-0.8509**

X	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Y	0	-0.085	-0.171	-0.259	-0.349	-0.443	-0.541	-0.645	-0.755
Y'	-0.850	-0.855	-0.868	-0.889	-0.919	-0.959	-1.008	-1.068	-1.138

X	0.9	1.0
Y	-0.873	-1
Y'	-1.219	-1.313



Lab2_Question 1:

Solve the following Ordinary differential equation (ODE) using Shooting Method ?

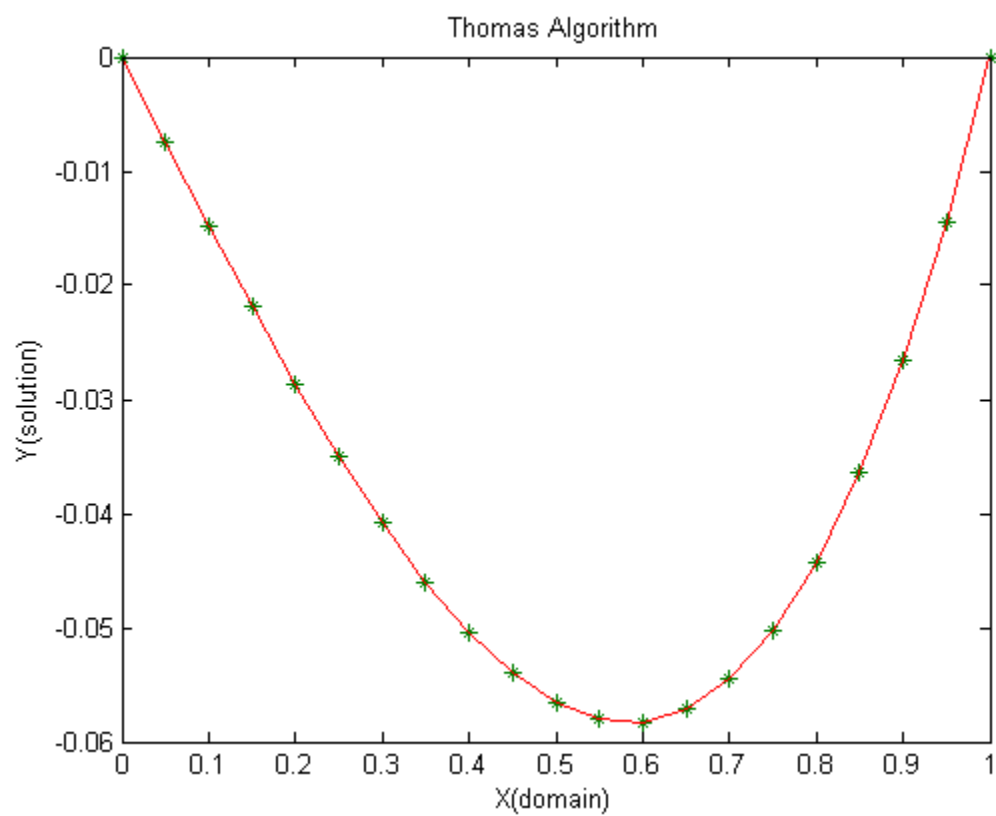
$$y'' = x + y$$

Given $y(0)=0$, $y(1)=0$, $h = 0.05$

Solution -:

X	0	.05	.1	.15	.2	.25	.3	.35	.4
Y	0.0	-0.0074	-0.0148	-0.0219	-0.0287	-0.0350	-0.0409	-0.0461	-0.0505

X	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95
Y	-.0540	-.0566	-.0580	-.0582	-.0571	-.0545	-.0503	-.0443	-.0364	-.0265	-.0144



Lab2_Question 2:

Solve the following Ordinary differential equation (ODE) using Shooting Method ?

$$y'' + 2xy' + 2y = 4x$$

Given $y(0)=1$, $y(0.5)=1.279$, $h = 0.025$

Solution -:

X	0	.025	.05	.075	.10	.125	.15	.175	.20	.225
Y	1	1.0244	1.0475	1.0694	1.0901	1.1096	1.1278	1.1449	1.1609	1.1758

X	.25	.275	.3	.325	.35	.375	.40	.425	.45	.475
Y	1.1895	1.2023	1.2141	1.2249	1.2349	1.2440	1.2523	1.2599	1.2668	1.2732

X	0.5
Y	1.279

