MA322: Scientific Computing

Lab Assignment 4

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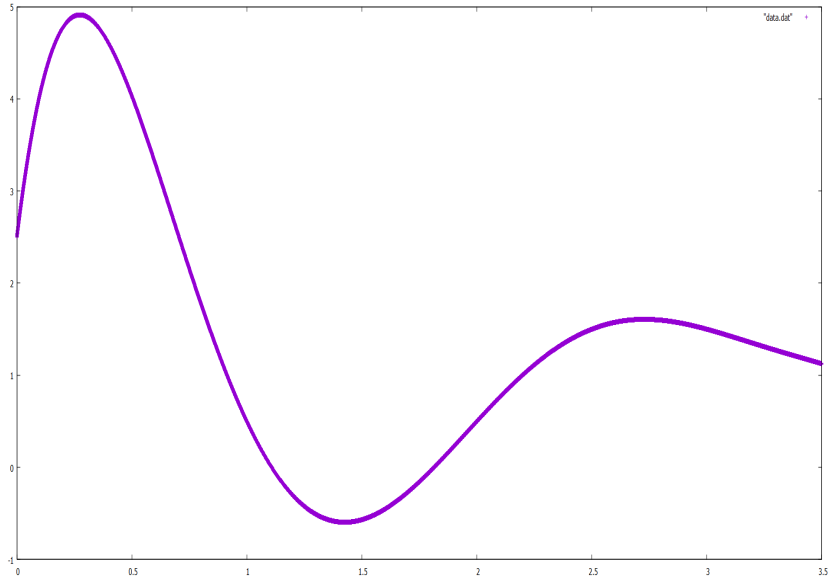
Q.1) By the method of Newton's Divided Difference Interpolation,

```
f(0.5) = 4.03125
f(1.5) = -0.566964
```

Using Gnuplot, the interpolated graph has been plotted : -



Observations from the graph : -

i) $f(x)\ is\ not\ \geq 0\ \ \forall\, x \in [x_0\,,\ x_5]$

ii) $f(x_0)\ is\ not\ \geq f(x)\ \ \forall\, x\ \in [x_0\,,\ x_5]$

Steps to run the code : -

i) A "data.dat" file is generated and saved in the same directory following the code's compilation and execution.

ii) The Command Prompt is opened and the command “gnuplot” is typed.

iii) Finally, the command “plot “data.dat” “ is typed.

Q.5) The following is the output : -

(x_0 , y_0)	**Roots = (x , y)**	**Order Of Convergence**	**Number of Iterations**
(1.2 , 2.5)	(1.33636, 1.75424)	1.99225	5
(-2 , 2.5)	(-0.901266, -2.08659)	1.96364	9
(-1.2 , -2.5)	(-0.901266, -2.08659)	1.87671	5
(2 , -2.5)	(-3.00162, 0.148108)	1.93749	20