MA322 Scientific Computing lab: 08

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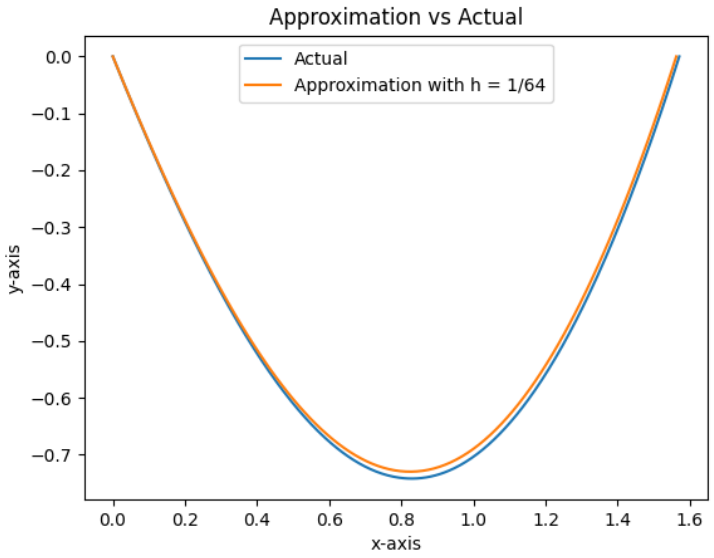
- To execute my .py file
  Run **$python3 180123029_NamanGoyal.py** on the terminal. Screenshots are attached question-wise

Ques.1

```
~/Desktop/IITG_SEMVI/sci_lab/lab08
python3 180123029_NamanGoyal.py
------------------Q1------------------

        y(1/2)  fd sol (1/2)     Error  Err Ratio
1/4  -0.610088     -0.548903 -0.061185   0.111468
1/8  -0.610088     -0.546087 -0.064001   0.117199
1/16 -0.610088     -0.602438 -0.007650   0.012698
1/32 -0.610088     -0.602241 -0.007847   0.013030
1/64 -0.610088     -0.602192 -0.007896   0.013113
-----------------------------------------------------------
```

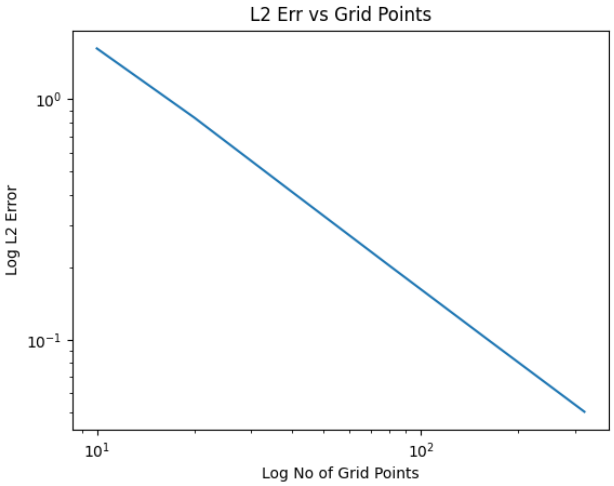
- The comparison using graph is shown below:

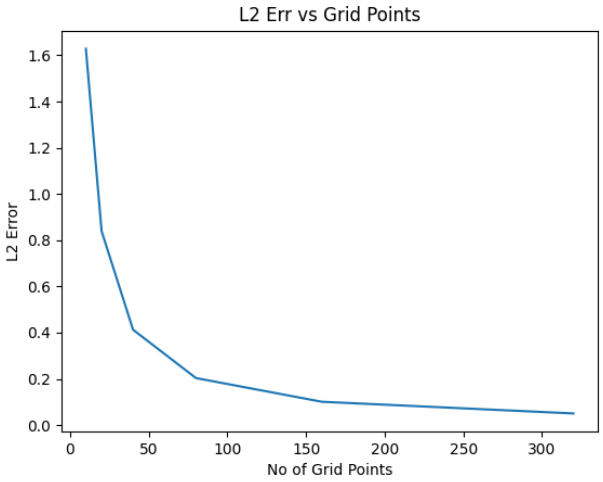


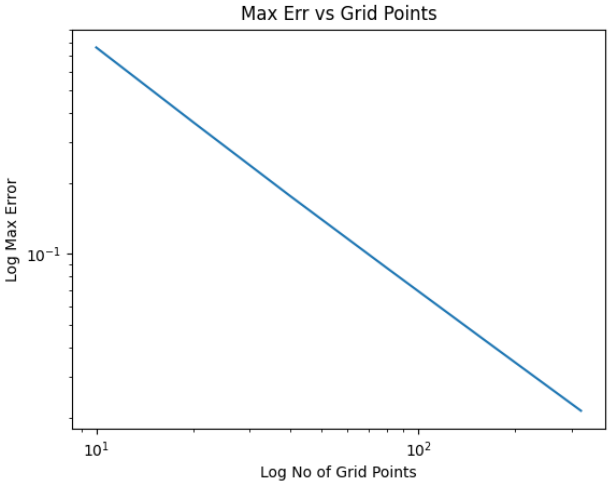
Ques.2

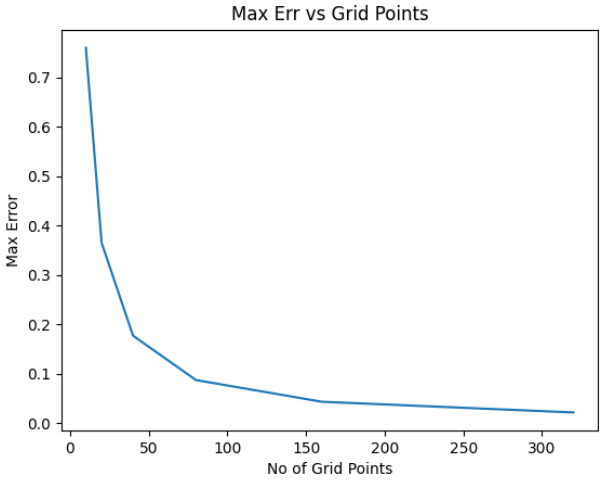
A pdf is been attached here for the proof name : **“180123029_NamanGoyal_SciLab08_Q2”**

- The graphs obtained for Errors vs No of grid points is shown below:









Ques.3

```
------------------Q3------------------

       Actual    Approx       Err
0    1.000000  1.000000  0.000000
1/3  1.457892  1.454869  0.003022
2/3  2.228801  2.225020  0.003782
1    3.436564  3.436564  0.000000
------------------------------------------------------------
```

Ques.4

```
------------------Q4------------------

Errors for following Schemes:
       Central  Backward   Forward
0.00  0.000000  0.000000  0.000000
0.25  0.002032  0.016264  2.076415
0.50  0.005502  0.068779  0.685615
0.75  0.193324  0.198879  1.533341
1.00  0.000000  0.000000  0.000000

------------------------------------------------------------
```