Assignment 3

Problem: Construct an appropriate polynomial for the following data using Newton's Divided Difference method by following the question below step by step:

1. [2 point] Use the Newton's divided-difference method for $f(x) = \sin(x)$ to find the values of $a_0, \cdots, a_2$ using the nodes $[0, \pi/2, \pi]$
2. [1 point] Write down the interpolating polynomial.
3. [2 points] Add a new node $3\pi/2$ to the above nodes, and find the interpolating polynomial.
4. [2 points] Write down the interpolation error term for the above polynomial, and identify the polynomial $w(x)$
5. [3 points] Estimate the upper bound of the interpolation error between the given function, $f(x) = \sin(x)$ and the interpolating function with four nodes.

Submission of the Assignment # 3:

- Solve all the problems above.
- Prepare a title page including Your Name, Your ID#, Theory Section #.
- Prepare a single .pdf or .jpg file containing the title page and the solution pages.
- To submit your assignment solution, visit the Submission Link (Click here). This will take y

to a Google Form link.

- Fill up the Google Form link with correct information and upload the file there. You are done.

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