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Assignment # 3

Question 1: Construct an appropriate polynomial for the following data using Hermite basis by following the question below step by step:

x	$f(x)$	$f'(x)$
0.1	-0.62049958	3.58502082
0.2	-0.28398668	3.14033271
0.3	0.00660095	2.66668043

1. [3 marks] Find the Lagrange basis from the given data.
2. [3 marks] Using the values in part i, compute the Hermite basis and simplify your expression as much as possible.
3. [2 marks] Finally find the expression of the interpolating Hermite polynomial.

Question 2: The set of a floating-point numbers is defined by F, where F is:

$$\pm (0.1d_1d_2d_3\dots d_m)_\beta \cdot \beta^e, \text{ with } \beta = 2, -2 \leq e \leq 5, m = 4$$



1. [1 mark] What is the maximum number that can be stored in this system?

1. [1 mark] What is the maximum number that can be stored in this system?

2. [1 mark] What is the minimum number that can be stored in this system?

3. [2 mark] How many different sets of numbers can we store in this System?

4. [1 mark] What would be the maximum number of the system if there is no support for negative numbers?

5. [1 mark] What would be the minimum number of the system if there is no support for negative numbers?

6. [1 mark] Calculate all the decimal numbers for $e=5$ and plot them on a real line.

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 you 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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