CMSC 660 HW V

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Problem Statement: For a fixed $n \in \mathbb{N}$, we wish to find $\alpha_{l1 \leq l \leq N}$ which are solutions of the linear system

$$\forall (i_x, i_y) \in \mathbb{N}^2, i_x + i_y \leq n, \sum_{l=1}^{N} \alpha_l \delta_x^{i_x} \delta_y^{i_y} \phi_l(\mathbf{x}_0) = \delta_x^{i_x} \delta_y^{i_y} u_E(\mathbf{x}_0) \tag{1}$$

1 Problem 1

Implement a function which computes the matrix of system (1).

1.1 a. Identify Inputs/Outputs

1.1.1 Answer

1.2 b. Choose an equation ordering

1.2.1 Answer

1.3 c. Implement and test the corresponding index function

The corresponding index function computes the index of the (i_x, i_y) equation

1.3.1 Answer

1.4 d. Derive a formula for the entries of the matrix

1.4.1 Answer

1.5 e. Implement and test a function that builds one column of the matrix

The function must compute the derivatives of one plane wave into the vector using the ordering from part b

1.5.1 Answer

1.6 f. Implement and test a function that builds the full matrix

1.6.1 Answer