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MECE 5397

Problem code: B02-4

Scientific Computing

for Mechanical Engineering

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Numerical solutions of Two-Dimensional Heat Diffusion Equation

* **Problem Statement: 2D Heat Diffusion Equation**

Domain of interest:

Boundary conditions:

Initial condition:

* **Discretization methods**

Two methods are chosen to discretize the 2D heat diffusion equation: To make the

+ Explicit discretization method:

+ Alternating direction implicit (ADI) method:

\* and discretized using the central difference approximation

\* is discretized using the forward approximation at half of a time step

From the discretization above, the discretized heat diffusion equation has the forms:

First half of a time step

\*

Second half of a time step

\*