MS Excel and VBA for Chemical Engineers

TSEC - Online Certificate Course

QUESTION SET

Aditya Ganesh Date: 22 - 06 - 2024

1 Using Tables efficiently

Download the steam tables from the following link. Click on the link that has **Excel Steam Tables** written in bold font.

https://learncheme.com/student-resources/steam-tables/

We will use the following formulae

- `VLOOKUP`
- `HLOOKUP`
- `INDEX`

2 Loops in VBA

- `For loop`
- `Do Loop`

3 Temperature distribution in a 2-Dimensional plate

The steady state temperature profile over a domain is given by the following boundary value problem.

$$\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} = 0 \tag{1}$$

Find the steady state temperature profile of the plate. The details are provided in the figure below.

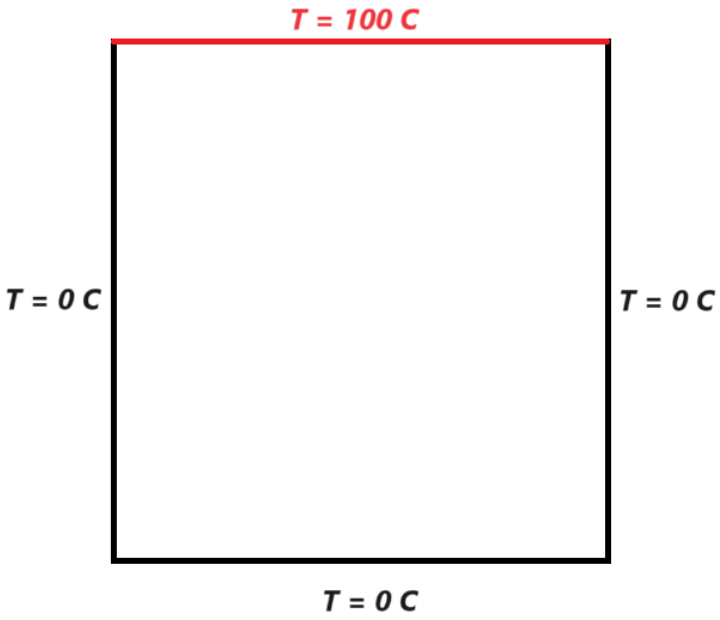

Figure 1: 2-Dimensional plate

The domain consists of 40×13 cells. For simplicity, assume $dx = dy = 1$ in our domain. The discretization derivation is given below

$$\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} = 0$$

$$\frac{T_{i+1,j} - 2T_{i,j} + T_{i-1,j}}{\cancel{dx^2}^{1}} + \frac{T_{i,j+1} - 2T_{i,j} + T_{i,j-1}}{\cancel{dy^2}^{1}} = 0 \tag{2}$$

$$T_{i,j} = \frac{T_{i+1,j} + T_{i-1,j} + T_{i,j+1} + T_{i,j-1}}{4} \tag{3}$$

Also try using other boundary conditions