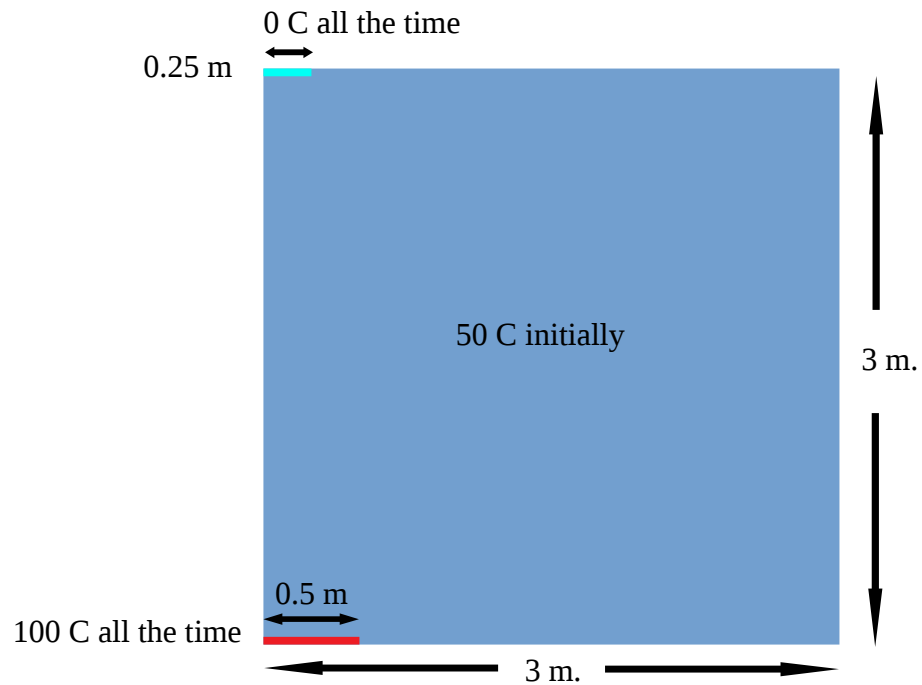Term Project 20% (individual work, same rule as the take home exam).

Project description:

Solve 2-D transient heat transfer problem by using python programming language and necessary libraries. Use backward finite difference scheme in time to solve for temperature at each time step. If you use forward finite difference scheme in time, you will get **zero** for this project. There are 5 sub-problems. One for each student.
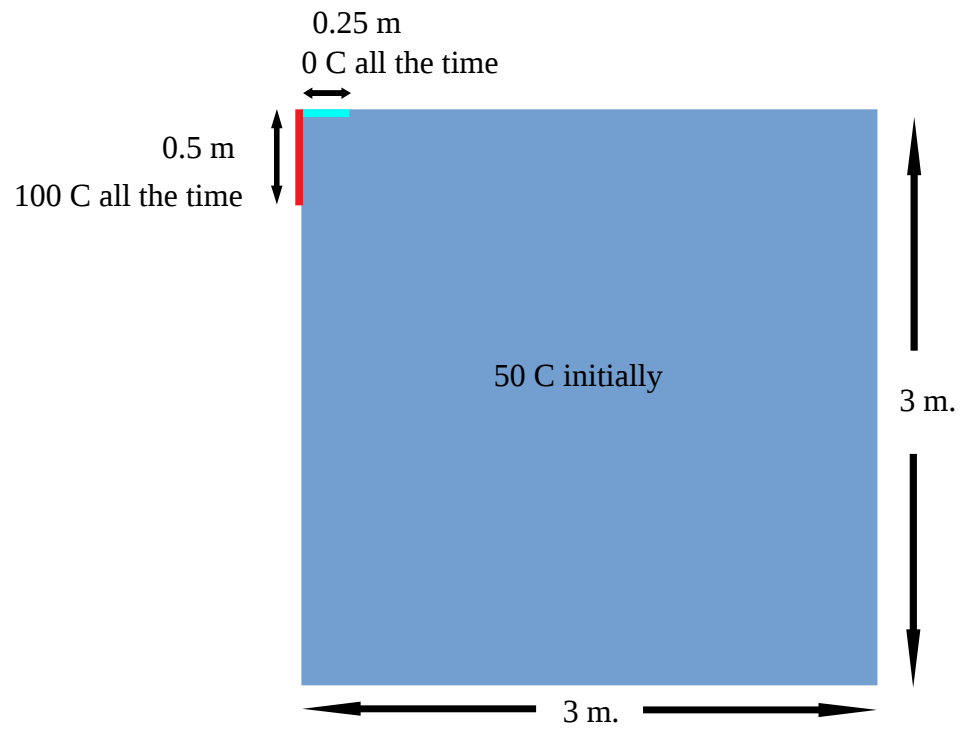
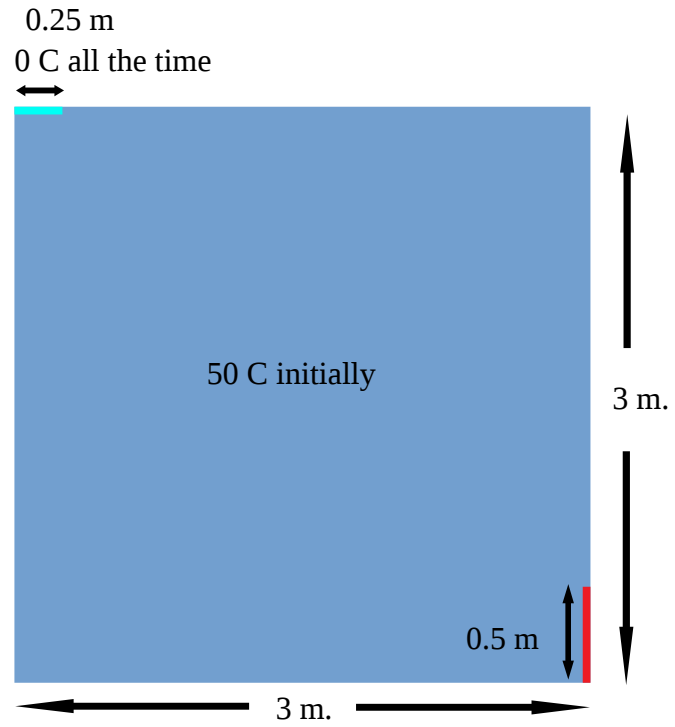Sub-problem 1: For **Jorge**,

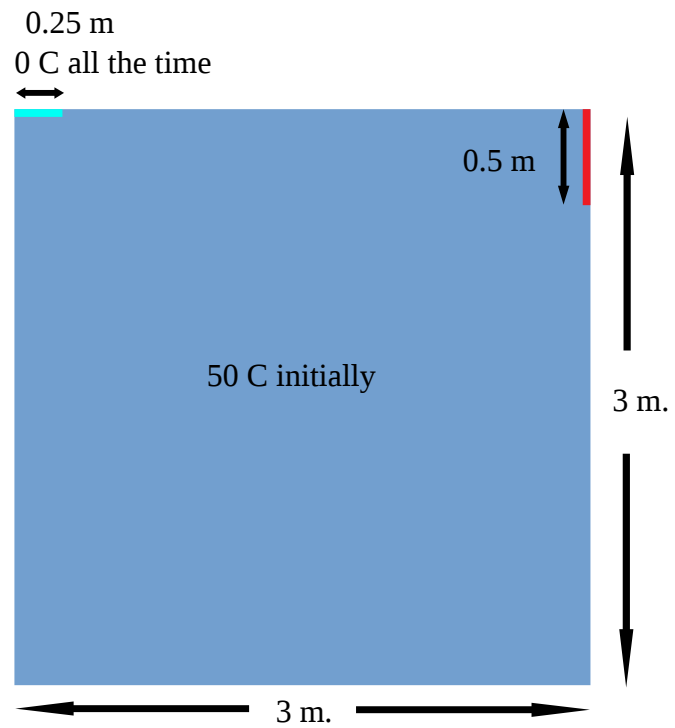Top-view

Sub-problem 2: For **Nhan**,

Top-view

0.25 m
0 C all the time

0.5 m
100 C all the time

50 C initially

3 m.

3 m.

Sub-problem 3: For **Zhe**,

Top-view

0.25 m
0 C all the time

50 C initially

3 m.

0.5 m

3 m.

Sub-problem 4: For **Amir**,

Top-view

0.25 m
0 C all the time

0.5 m

50 C initially

3 m.
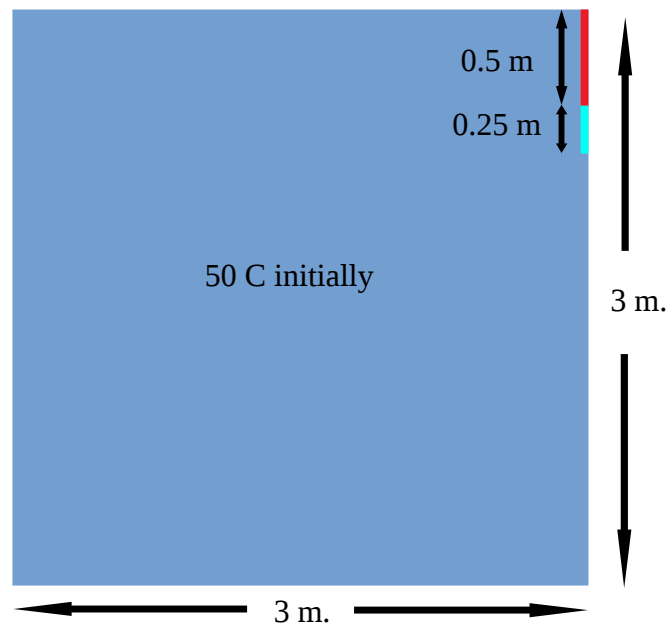
3 m.

Sub-problem 5: For **Dimkp**

Top-view

Initial condition for all sub-problems is that initially every location (except the constant temperature boundary condition portion) has the temperature of 50 degree C.

Boundary conditions: All edges have the perfect insulation boundary conditions (no heat loss), except the edge with red and light blue (teal) color. The edge with red color is the constant temperature boundary of 100 degree C (stay at 100 C all the time). The edge with light blue (teal) color is the constant temperature boundary of 0 degree C (stay at 0 C all the time).

The material for heat conduction is copper (use material property values as defined in class for copper).

Once the temperature at each grids are solved, then show the temperature distribution at various time-slices to show how temperature in the domain change with time.

New task: Show the temperature at the steady state condition or close to steady state condition (temperature profile does not change with time)