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HW 2
18-660

$$\rho \cdot C_p \cdot \frac{dT(x,t)}{dt} = k \cdot \frac{d^2T(x,t)}{dx^2}$$

Since steady-state, $\frac{dT(x,t)}{dt} = 0$

So, $k \cdot \frac{d^2T(x,t)}{dx^2} = 0$

$$k \cdot (-T_{i-1} + 2T_i - T_{i+1}) = 0 \quad (2 \le i \le 4)$$

$$\begin{aligned} -30 + 2T_2 - T_3 &= 0 \\ -T_2 + 2T_3 - T_4 &= 0 \\ -T_3 + 2T_4 - 100 &= 0 \end{aligned}$$

```
>> A=[2,-1,0;-1,2,-1;0,-1,2]

A =

     2    -1     0
    -1     2    -1
     0    -1     2

>> B=[30;0;100]

B =

    30
     0
   100

>> x=A\B

x =

   47.5000
   65.0000
   82.5000

>>
```