$$
\begin{aligned}
-\frac{\mathrm{d}^2 u}{\mathrm{d}x^2} - u &= \sin x \\
u(0) &= 0 \\
\frac{\mathrm{d}u(2)}{\mathrm{d}x} - u(2) &= 0 \\
[0,2] \ni x \to u(x) &\in \mathbb{R}
\end{aligned}
$$

$$
\begin{aligned}
f'(x) &= \frac{f(x+h) - f(x-h)}{2h} \\
f''(x) &= \frac{f(x+h) + f(x-h) - 2f(x)}{h^2}
\end{aligned}
$$

$$
\begin{aligned}
-u'' - u &= \sin x \\
-\frac{u(x+h) + u(x-h) - 2u(x)}{h^2} - u(x) &= \sin x \\
-\frac{u_{i+1} + u_{i-1} - 2u_i}{h^2} - u_i &= \sin x_i \\
u_{i-1}\left[\frac{-1}{h^2}\right] + u_i\left[\frac{2}{h^2} - 1\right] + u_{i+1}\left[\frac{-1}{h^2}\right] &= \sin x_i
\end{aligned}
$$

$$
u_0 = 0
$$

$$
\begin{aligned}
u'(2) - u(2) &= 0 \\
\frac{u(2+h) - u(2-h)}{2h} - u(2) &= 0 \\
\frac{u_{n+1} - u_{n-1}}{2h} - u_n &= 0 \\
u_{n+1} - u_{n-1} - 2hu_n &= 0 \\
u_{n+1} &= u_{n-1} + 2hu_n
\end{aligned}
$$

$$
\begin{aligned}
u_{n-1}\left[\frac{-1}{h^2}\right] + u_n\left[\frac{2}{h^2} - 1\right] + (u_{n-1} + 2hu_n)\left[\frac{-1}{h^2}\right] &= \sin x_n \\
u_{n-1}\left[\frac{-1}{h^2}\right] + u_n\left[\frac{2}{h^2} - 1\right] + u_{n-1}\left[\frac{-1}{h^2}\right] + u_n\left[\frac{-2}{h}\right] &= \sin x_n \\
u_{n-1}\left[\frac{-2}{h^2}\right] + u_n\left[\frac{2}{h^2} - 1 - \frac{2}{h}\right] &= \sin x_n
\end{aligned}
$$

$$
\begin{bmatrix}
1 & 0 & & & \cdots & & & & 0 \\
& & \ddots & & & & & & \\
\vdots & \cdots & 0 & \left[\frac{-1}{h^2}\right] & \left[\frac{2}{h^2} - 1\right] & \left[\frac{-1}{h^2}\right] & 0 & \cdots & \vdots \\
& & & & & \ddots & & & \\
0 & & & & \cdots & & \left[\frac{-2}{h^2}\right] & \left[\frac{2}{h^2} - 1 - \frac{2}{h}\right] &
\end{bmatrix}
\cdot
\begin{bmatrix}
u_0 \\ \\ \vdots \\ \\ u_n
\end{bmatrix}
=
\begin{bmatrix}
0 \\ \vdots \\ \sin x_i \\ \vdots \\ \sin x_n
\end{bmatrix}
$$