

Selected Topics in CFD - list 5

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1.

Try to solve the 1D Poisson equation:

$$\frac{d^2u}{dx^2} = f, \quad x \in [0, \pi]$$

with:

- a) $f = \sin(x), \quad u|_{x=0} = 0, \quad u|_{x=\pi} = 1$
- b) $f = \sin(x), \quad \frac{du}{dx}|_{x=0} = 1, \quad \frac{du}{dx}|_{x=\pi} = 0$
- c) $f = -\sin(2x), \quad \frac{du}{dx}|_{x=0} = 1, \quad \frac{du}{dx}|_{x=\pi} = 1$

For the purpose of this exercise, feel free to use `np.linalg.solve`.