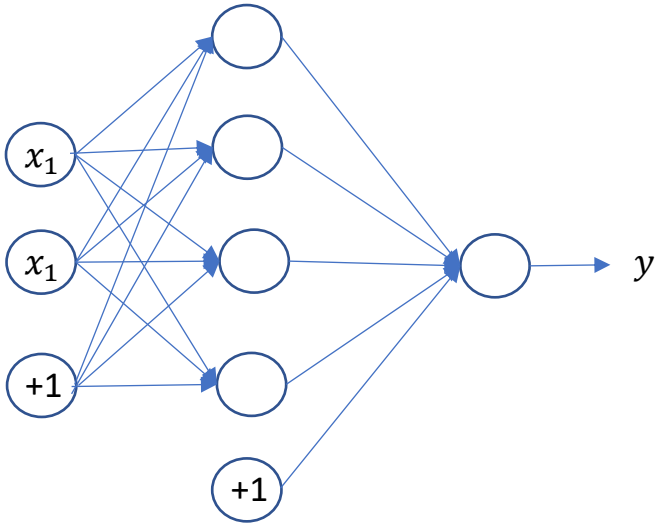

A three-layer feedforward network consists of a perceptron hidden layer and a linear output neuron and receives inputs (x_1, x_2). Use the network to predict the following function:

$$y = sin(\pi x_1)cos(2\pi x_2)$$

where $-1.0 \leq x_1, x_2 \leq +1.0$.

Use data points distributed in an equally spaced 10x10 grid spanning the input space and the following procedures for training and testing:

1. Random subsampling with 70:30 data-split for training and testing.
2. Five-fold cross validation
3. Three-way data split

Repeat each procedure in 10 different experiments and determine the optimal number of hidden neurons and the test error.

Use a learning factor $\alpha = 0.05$, leaning up to 2500 iterations, and $\{2, 4, 6, 8, 10\}$ as search space for the number of hidden neurons.