```
input_layer_size = 3
hidden_layer_size = 5
num_labels = 3
m = 5
```

$X : 5 \times 4$

$y : 5 \times 3$

$\Theta^{(1)} : 5 \times 4$

$\Theta^{(2)} : 3 \times 6$

$$X = \begin{pmatrix} 1 & x_1^{(1)} & x_2^{(1)} & x_3^{(1)} \\ 1 & x_1^{(2)} & x_2^{(2)} & x_3^{(2)} \\ 1 & x_1^{(3)} & x_2^{(3)} & x_3^{(3)} \\ 1 & x_1^{(4)} & x_2^{(4)} & x_3^{(4)} \\ 1 & x_1^{(5)} & x_2^{(5)} & x_3^{(5)} \end{pmatrix} \qquad y = \begin{pmatrix} y_1^{(1)} & y_2^{(1)} & y_3^{(1)} \\ y_1^{(2)} & y_2^{(2)} & y_3^{(2)} \\ y_1^{(3)} & y_2^{(3)} & y_3^{(3)} \\ y_1^{(4)} & y_2^{(4)} & y_3^{(4)} \\ y_1^{(5)} & y_2^{(5)} & y_3^{(5)} \end{pmatrix}$$

$$\Theta^{(1)} = \begin{pmatrix} \Theta_{1,0}^{(1)} & \Theta_{1,1}^{(1)} & \Theta_{1,2}^{(1)} & \Theta_{1,3}^{(1)} \\ \Theta_{2,0}^{(1)} & \Theta_{2,1}^{(1)} & \Theta_{2,2}^{(1)} & \Theta_{2,3}^{(1)} \\ \Theta_{3,0}^{(1)} & \Theta_{3,1}^{(1)} & \Theta_{3,2}^{(1)} & \Theta_{3,3}^{(1)} \\ \Theta_{4,0}^{(1)} & \Theta_{4,1}^{(1)} & \Theta_{4,2}^{(1)} & \Theta_{4,3}^{(1)} \\ \Theta_{5,0}^{(1)} & \Theta_{5,1}^{(1)} & \Theta_{5,2}^{(1)} & \Theta_{5,3}^{(1)} \end{pmatrix} \quad \Theta^{(2)} = \begin{pmatrix} \Theta_{1,0}^{(2)} & \Theta_{1,1}^{(2)} & \Theta_{1,2}^{(2)} & \Theta_{1,3}^{(2)} & \Theta_{1,4}^{(2)} & \Theta_{1,5}^{(2)} \\ \Theta_{2,0}^{(2)} & \Theta_{2,1}^{(2)} & \Theta_{2,2}^{(2)} & \Theta_{2,3}^{(2)} & \Theta_{2,4}^{(2)} & \Theta_{2,5}^{(2)} \\ \Theta_{3,0}^{(2)} & \Theta_{3,1}^{(2)} & \Theta_{3,2}^{(2)} & \Theta_{3,3}^{(2)} & \Theta_{3,4}^{(2)} & \Theta_{3,5}^{(2)} \end{pmatrix}$$