Exercises for Lecture 15

1. Backprop for a neural network with relu activation

Derive the backprop equations for $\frac{\partial E}{\partial w_{ji}}$ and $\frac{\partial E}{\partial w_{kj}}$for the 2-layer network below.

$$z_j = \text{relu}\left(\sum_j w_{ji} x_i\right)$$
$$y_k = \sum_k w_{kj} z_j$$
$$E(w) = \frac{1}{2}\sum_k (y_k - t_k)^2$$

Here x, t denote the training sample and target respectively.

Remember that relu is given by

$$\text{relu}(a) = \max(a, 0)$$