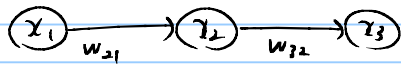


本文に明記していないが、(8.16) は $i \leq j$ の場合のみ成立する式である。 $i > j$ のときは $\text{cov}[x_i, x_j] = \text{cov}[x_j, x_i]$ (8.7)



(8.15) 8.1)

$$E[x_1] = b_1$$

$$E[x_2] = w_{21} E[x_1] + b_2 = w_{21} b_1 + b_2$$

$$E[x_3] = w_{32} E[x_2] + b_3 = w_{32} (w_{21} b_1 + b_2) + b_3$$

8.2

$$\mu = (b_1, w_{21} b_1 + b_2, w_{32} (w_{21} b_1 + b_2) + b_3)^T$$

(8.16) 8.1)

$$\text{cov}[x_1, x_1] = v_1$$

$$\text{cov}[x_1, x_2] = w_{21} \text{cov}[x_1, x_1] = w_{21} v_1$$

$$\text{cov}[x_1, x_3] = w_{32} \text{cov}[x_1, x_2] = w_{32} w_{21} v_1$$

$$\text{cov}[x_2, x_2] = w_{21} \text{cov}[x_2, x_1] + v_2 = w_{21}^2 v_1 + v_2 \quad \leftarrow \text{cov}[x_2, x_1] = \text{cov}[x_1, x_2]$$

$$\text{cov}[x_2, x_3] = w_{32} \text{cov}[x_2, x_2] = w_{32} (w_{21}^2 v_1 + v_2)$$

$$\text{cov}[x_3, x_3] = w_{32} \text{cov}[x_3, x_2] + v_3 = w_{32}^2 (w_{21}^2 v_1 + v_2) + v_3 \quad \leftarrow \text{cov}[x_3, x_2] = \text{cov}[x_2, x_3]$$

8.2

$$\Sigma = \begin{pmatrix} v_1 & w_{21} v_1 & w_{32} w_{21} v_1 \\ w_{21} v_1 & w_{21}^2 v_1 + v_2 & w_{32} (w_{21}^2 v_1 + v_2) \\ w_{32} w_{21} v_1 & w_{32} (w_{21}^2 v_1 + v_2) & w_{32}^2 (w_{21}^2 v_1 + v_2) + v_3 \end{pmatrix}$$