The Career Atlas: Mathematical Notation

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$$\boldsymbol{\Lambda} = (\Lambda_1, ..., \Lambda_n), \tag{1}$$

$$\Lambda_k = \Lambda(\boldsymbol{h_k}, \boldsymbol{ß_k}, \boldsymbol{w}) = \left(\frac{1}{W}\right) \sum_{q=1}^{n} h_{k,q} ß_{k,q} w_q, \tag{2}$$

$$\mathrm{vs}_k = \mathrm{vs}(\boldsymbol{h_k}, \boldsymbol{ß_k}, \boldsymbol{w}, \boldsymbol{y}) = \left(\frac{1}{W}\right) \sum_{q=1}^{n} h_{k,q} ß_{q,k} w_q u(y_q, y_k), \tag{3}$$

$$ß_{k,q} = \mathrm{eq}(s(\boldsymbol{a_k}, \boldsymbol{a_q}), c_q) \tag{4}$$

$$u(y_q, y_k) = \begin{cases} 1, \text{if } y_k \geq y_q. \\ 0, \text{otherwise.} \end{cases} \tag{5}$$

$$W = \sum_{q=1}^{n} w_q \tag{6}$$

$$\mathbf{ß} = \begin{bmatrix} ß_{1,1} & \cdots & ß_{n,1} \\ \vdots & \ddots & \vdots \\ ß_{1,n} & \cdots & ß_{n,n} \end{bmatrix} = \begin{bmatrix} 1 & \cdots & ß_{k,1} & \cdots & ß_{n,1} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ ß_{1,k} & \cdots & 1 & \cdots & ß_{n,k} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ ß_{1,n} & \cdots & ß_{k,n} & \cdots & 1 \end{bmatrix} \tag{7}$$

$$\boldsymbol{ß_k} = (ß_{k,1}, ..., ß_{k,n}) \tag{8}$$

$$\boldsymbol{ß_q} = (ß_{q,1}, ..., ß_{q,n}) \tag{9}$$

$$\gamma_k = \left(\frac{1}{m}\right) \sum_{i=1}^{m} \hat{a}_i^k \tag{10}$$

$$\gamma_k = \frac{1}{m} \sum_{i=1}^{m} \hat{a}_i^k \tag{11}$$

$$\gamma_k = \sum_{i=1}^{m} \frac{\hat{a}_i^k}{m} \tag{12}$$

$$\gamma_k = \sum_{i=1}^{m} \hat{a}_i^k / m \tag{13}$$

$$\gamma_k = \left(\frac{1}{m}\right) \sum_{i=1}^{m} \frac{a_i^k}{\max a_j^k}, \tag{14}$$

$$\boldsymbol{\hat{a}_k} = (\hat{a}_1^k, ..., \hat{a}_m^k) \tag{15}$$

$$\hat{a}_i^k = \frac{a_i^k}{\max a_j^k} \tag{16}$$

$$c_k = c(\boldsymbol{a_k}, \gamma_k) = \frac{\sum_{i=1}^{m} \ddot{a}_i^k \tilde{a}_i^k}{\sum_{i=1}^{m} \ddot{a}_i^k}, \tag{17}$$

$$\ddot{a}_i^k = \mathrm{eq}(\hat{a}_i^k, \gamma_k) = \mathrm{eq}\left(\frac{a_i^k}{\max a_j^k}, \gamma_k\right) \tag{18}$$

$$c_k = c(\boldsymbol{a_k}, \gamma_k) = \frac{\sum_{i=1}^{m} a_i^k \tilde{a}_i^k}{\sum_{i=1}^{m} a_i^k}?, \tag{19}$$

$$\boldsymbol{\ddot{a}_k} = (\ddot{a}_1^k, ..., \ddot{a}_m^k) \tag{20}$$

$$\boldsymbol{\ddot{a}_q} = (\ddot{a}_1^q, ..., \ddot{a}_m^q) \tag{21}$$

$$\boldsymbol{\ddot{a}_n} = (\ddot{a}_1^n, ..., \ddot{a}_m^n) \tag{22}$$

$$\mathbf{\ddot{A}} = \begin{bmatrix} \ddot{a}_1^1 & \dots & \ddot{a}_m^1 \\ \vdots & \ddots & \vdots \\ \ddot{a}_1^n & \dots & \ddot{a}_m^n \end{bmatrix} \tag{23}$$

$$\ddot{\tau}_{k,q} = \mathrm{edq}(\tau_k, \tau_q, c_q) = \left\{1 + \exp\left[-\frac{\tau_q(1 + \tau_k - \tau_q)}{1 - c_q}\right]\right\}^{-1} \tag{24}$$

$$ß_{k,q} = \ddot{s}_{k,q} \times \ddot{\tau}_{k,q} = \mathrm{eq}(s(\boldsymbol{a_k}, \boldsymbol{a_q}), c_q) \times \mathrm{edq}(\tau_k, \tau_q, c_q) \tag{25}$$

$$\text{notation for a binary indicator (bin) operator?} \tag{26}$$

$$\mathrm{bin}(x_{k,q}) = \begin{cases} 1, \text{if } x_{k,q} \geq 0.5. \\ 0, \text{otherwise.} \end{cases} \tag{27}$$

$$\text{hireability–interchangeability distinction:} \tag{28}$$

$$\text{sufficiently qualified (sq) vs sufficiently similar (ss, ß)} \tag{29}$$

$$\text{meets minimum requirements vs same shape} \tag{30}$$

$$\mathrm{sq}(\boldsymbol{a_k}, \boldsymbol{a_q}) = 1 - \sqrt{\frac{\sum_{i=1}^{m} \ddot{a}_i^q \delta(a_i^k, a_i^q)^2}{\sum_{i=1}^{m} \ddot{a}_i^q \max(100 - a_i^q, a_i^q)^2}}, \tag{31}$$

$$\delta(a_i^k, a_i^q) = \max(a_i^q - a_i^k, 0) \tag{32}$$

$$h_{k,q} = h(\mathrm{sq}_{k,q}, c_q) = h(\mathrm{sq}(\boldsymbol{a_k}, \boldsymbol{a_q}), c_q) = \ddot{\mathrm{sq}}_{k,q} = \mathrm{eq}\left(\mathrm{sq}_{k,q}, c_q\right) \tag{33}$$

$$\text{to be hireable is: } \mathrm{bin}(h_{k,q}, c_q) = \begin{cases} 1, \text{if } h_{k,q} \geq 0.5^{1-c_q}. \\ 0, \text{otherwise.} \end{cases} \tag{34}$$

$$\text{Attribute macro-flexibility:} \tag{35}$$

$$\Phi_i = \left(\frac{1}{W}\right) \sum_{k=1}^{n} \tilde{a}_i^k w_k \tag{36}$$