9.

From the definition of scaled decision stumps $g_{i,\theta}(x) = \llbracket x_i \geq \theta \rrbracket$, we obtain:

$$
\begin{aligned}
\mathbf{\Phi}_{ds}(\mathbf{x}) &= \left[g_{1,\theta_1}(\mathbf{x}) \cdots g_{d,\theta_k}(\mathbf{x})\right]^T \\
&= \left[\llbracket x_1 \geq \theta_1 \rrbracket \cdots \llbracket x_d \geq \theta_k \rrbracket\right]^T
\end{aligned}
$$

where d is the dimension of $\mathbf{x}$.

Also, we have $\theta \in \{\theta_1 = L + 0.5, \theta_2 = L + 1.5, \cdots, \theta_k = R - 0.5\}$, so:

$$
\mathbf{\Phi}_{ds}(\mathbf{x}) = \begin{bmatrix} \llbracket x_1 \geq L + 0.5 \rrbracket \\ \llbracket x_2 \geq L + 1.5 \rrbracket \\ \vdots \\ \llbracket x_{d-1} \geq R - 1.5 \rrbracket \\ \llbracket x_d \geq R - 0.5 \rrbracket \end{bmatrix}
$$

Substituting this result into the definition of $K_{ds}(\mathbf{x}, \mathbf{x}')$, we obtain:

$$
\begin{aligned}
K_{ds}(\mathbf{x}, \mathbf{x}') &= \mathbf{\Phi}_{ds}(\mathbf{x})^T \mathbf{\Phi}_{ds}(\mathbf{x}') \\
&= \begin{bmatrix} \rrbracket[x_1 \geq L + 0.5 \rrbracket & \rrbracket[x_2 \geq L + 1.5 \rrbracket & \ldots & \rrbracket[x_{d-1} \geq R - 1.5 \rrbracket & \rrbracket[x_d \geq R - 0.5 \rrbracket \end{bmatrix} \\
&\quad \times \begin{bmatrix} \rrbracket[x'_1 \geq L + 0.5 \rrbracket \\ \rrbracket[x'_2 \geq L + 1.5 \rrbracket \\ \vdots \\ \rrbracket[x'_{d-1} \geq R - 1.5 \rrbracket \\ \rrbracket[x'_d \geq R - 0.5 \rrbracket \end{bmatrix} \\
&= \sum_{i=1}^{d} \rrbracket[x_i \geq \theta_i \rrbracket \rrbracket[x'_i \geq \theta_i \rrbracket
\end{aligned}
$$

Therefore, we got the definition of $K_{ds}(\mathbf{x}, \mathbf{x}')$, and the meaning is to count how many dimensions i of the 2 vectors satisfy the condition that both:

$$
x_i \geq \theta_i \quad \text{and} \quad x'_i \geq \theta_i
$$