Binary Image Processing Notes
HL

$$\bar{x} \triangleq \frac{\iint_{\Omega} x\, B(x,y)\, dx\, dy}{\iint_{\Omega} B(x,y)\, dx\, dy} \quad \cdots (1)$$

Where, the Area of $B(x,y)$ is
defined as

$$A \triangleq \iint_{\Omega} B(x,y)\, dx\, dy \quad \cdots (2)$$

$$\bar{y} \triangleq \iint_{\Omega} y\, B(x,y)\, dx\, dy \Big/ A \cdots (3)$$

And

$$\mathcal{M}_{pq} \triangleq \frac{\iint_{\Omega} (x-\bar{x})^{p}(y-\bar{y})^{q}\, B(x,y)\, dx\, dy}{A}$$

Example, for $p=2, q=1$, we have

$$\mathcal{M}_{21} = \frac{\iint_{\Omega} (x-\bar{x})^{2}(y-\bar{y})\, B(x,y)\, dx\, dy}{A} \quad \cdots (4)$$

Now, for $\bar{x}^{K}$, we have

$$\bar{x}^{K} \triangleq \frac{\iint_{\Omega} x^{K} B(x,y)\, dx\, dy}{A} \quad \cdots (5)$$

$$\bar{y}^{K} \triangleq \frac{\iint_{\Omega} y^{K} B(x,y)\, dx\, dy}{A} \quad \cdots (6)$$

For Computation Example, see the
handout on the class Website.

(END)