ring homo $\phi : \mathbb{C}[x,y] \to \mathbb{C}[x,y]/\langle xy\rangle$ such that

$$\phi(xy\cdot f(x,y)+p(x)+q(y)) = p(x)+q(y)+\langle xy\rangle$$

$$\begin{aligned} &= \sum a(n)x^n + \sum b(m)y^m + c \\ &\text{or} \\ &\sum a(n)(x-\alpha)^n + \sum b(m)(y-\beta)^m + c \\ &\text{or} \\ &\sum a(n)(x-\alpha)^n + \sum b(m)y^m + c \\ &\text{or} \\ &\sum a(n)x^n + \sum b(m)\cdot(y-\beta)^m + c \end{aligned}$$

다양하게 표현가능.

① $\mathbb{C}[x,y]/\langle xy\rangle$ 의 max ideal $= \{\sum a(n)(x-\alpha)^n + \sum b(m)y^m\}$ or $\{\sum a(n)x^n + \sum b(m)(y-\beta)^m\}$

$= \langle x-\alpha, y\rangle$ or $\langle x, y-\beta\rangle$

$= \langle xy\rangle$

② On the other hand, for $\mathbb{C}[x,y]$,

max ideal $= \langle x-\alpha, y-\beta\rangle = \{(x-\alpha)(y-\beta)f(x,y) \mid f\in \mathbb{C}[x,y]\}$

$\langle xy\rangle$:= max ideal containing xy = max ideal containing x or y

$= \langle x, y-\beta\rangle$ or $\langle x-\alpha, y\rangle$

$\therefore \{\mathbb{C}[x,y]$ 의 max containing $xy\}$ $\overset{일대일대응}{\longleftrightarrow}$ $\{\mathbb{C}[x,y]/xy$ 의 max$\}$

$\langle x-\alpha, y\rangle$ or $\langle x, y-\beta\rangle$ $\longleftrightarrow$ $\langle x-\alpha, y\rangle$ or $\langle x, y-\beta\rangle$