CORRECTION

- GET a new actual measurement (z)

$$z = \begin{bmatrix} x_m \\ y_m \end{bmatrix}$$

where x_m, y_m are the MEASURED POSITION VAL.

MEASUREMENT MATRIX (H)

$\hat{x}^- = [x, y, \dot{x}, \dot{y}]^T$ as predicted,
but actual measure comes $z = [x_{measured}, y_{measured}]^T$.
So, H (measurment matrix) will map the
$\hat{x}^-$ (state vector) to the z (measurement space)

$$\because H = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

$$\therefore z = H\hat{x}^- = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ \dot{x} \\ \dot{y} \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix}$$

- MEASUREMENT RESIDUAL (y): (actual measurement) − (Predicted measurement)

$$y = z - H \cdot \hat{x}^-$$

where $\hat{x}^-$ is the PREDICTED STATE VECTOR.