$$\begin{cases} y(t) = z'(t) \\ y'(t) = -y(t) - z(t) + 1 \\ y(0) = 1 \\ z(0) = -1 \end{cases}$$

$$X = \begin{pmatrix} z \\ y \end{pmatrix}$$

$$X' = \begin{pmatrix} z' \\ y' \end{pmatrix} = \begin{pmatrix} y \\ -y-z+1 \end{pmatrix}$$

$$\begin{pmatrix} z \\ y \end{pmatrix}' = \begin{pmatrix} 0 & 1 \\ -1 & -1 \end{pmatrix} \begin{pmatrix} z \\ y \end{pmatrix} + \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$\begin{pmatrix} z \\ y \end{pmatrix}' = \begin{pmatrix} y \\ -z-y+1 \end{pmatrix}$$

Aplicar Heun a

$$\begin{pmatrix} z \\ y \end{pmatrix}' = \begin{pmatrix} y \\ -z-y+1 \end{pmatrix}$$

$$F\begin{pmatrix} z \\ y \end{pmatrix} = \begin{pmatrix} y \\ -z-y+1 \end{pmatrix}$$

$$(\text{Heun}): \begin{cases} X_{k+1}^{H} = X_k^{H} + \frac{h}{2}\left[F(x_k, X_k^{H}) + F(x_{k+1}, \underline{\underline{X_k^{H} + h\cdot F(x_k, X_k^{H})}})\right] \\ X_0^{H} = X_0 \end{cases}$$

$$(\text{EA}) \begin{cases} X_{k+1}^{E} = X_k^{E} + h\cdot F(x_k, X_k^{E}) \\ X_0^{E} = X_0 \end{cases}$$

$$X_1^{0} = \begin{pmatrix} z_1^{0} \\ y_1^{0} \end{pmatrix}$$

$$\begin{pmatrix} z_1^{1} \\ y_1^{1} \end{pmatrix} = \begin{pmatrix} z_1^{0} \\ y_1^{0} \end{pmatrix} + \frac{h}{2}\cdot\left[\begin{pmatrix} y_1^{0} \\ -z_1^{0} - y_1^{0} + 1 \end{pmatrix} + F\left(\begin{pmatrix} z_1^{0} \\ y_1^{0} \end{pmatrix} + h\cdot\begin{pmatrix} y_1^{0} \\ -z_1^{0} - y_1^{0} + 1 \end{pmatrix}\right)\right]$$