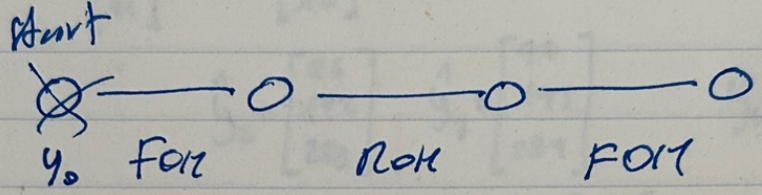
~~[illegible]~~

MIXED FOM-ROM (LSPG)

BDF1



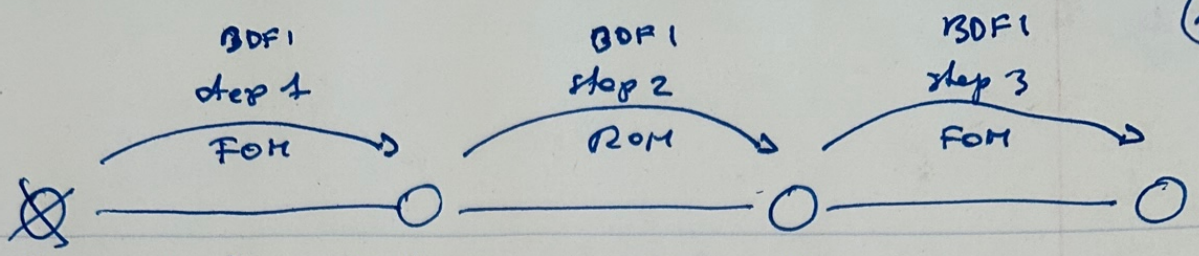
$\phi = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$ $dt = 2$ (called h below)

$y_0 = \begin{bmatrix} 10 \\ \vdots \\ 10 \end{bmatrix}$ initial FOM state

FOM size = 8

f( ) always return $\begin{bmatrix} 1 \\ 1 \\ \vdots \\ 1 \end{bmatrix}$

MAIN2_BDF1.cc



$y_0 \xrightarrow{R_1} y_1 \xrightarrow{R_2} y_2 \xrightarrow{R_3} \hat{y}_3 \xrightarrow{R_4} \hat{y}_4 \xrightarrow{R_5} y_5 \xrightarrow{R_6} y_6$

$\hat{y}_2 = \phi y_2$ $\quad y_4 = \phi \hat{y}_4$

$$y_0 = \begin{bmatrix} 10 \\ \vdots \\ 10 \end{bmatrix} \quad y_1 = \begin{bmatrix} 11 \\ \vdots \\ 11 \end{bmatrix} \quad y_2 = \begin{bmatrix} 12 \\ \vdots \\ 12 \end{bmatrix}$$

$$\hat{y}_2 = \begin{bmatrix} 96 \\ 192 \\ 288 \end{bmatrix} \quad \hat{y}_3 = \begin{bmatrix} 97 \\ 193 \\ 289 \end{bmatrix} \quad y_5 = \begin{bmatrix} 1356 \\ \vdots \\ 1356 \end{bmatrix}$$

$$\hat{y}_4 = \begin{bmatrix} 98 \\ 194 \\ 290 \end{bmatrix} \quad y_5 = \begin{bmatrix} 1357 \\ \vdots \\ 1357 \end{bmatrix}$$

$$y_6 = \begin{bmatrix} 1358 \\ \vdots \\ 1358 \end{bmatrix}$$

$R_1 = \cancel{y_0 - y_0} - hf = [-2 \dots -2]^T$

$R_2 = y_1 - y_0 - hf = [-1 \dots -1]^T$

$R_3 = \phi\phi y_2 - \phi\phi^T y_2 - hf = [-2 \dots -2]^T$

$R_4 = \cancel{\phi\phi} \hat{y}_3 - \phi \hat{y}_2 - hf = \begin{bmatrix} 1350 \\ \vdots \\ 1350 \end{bmatrix} - \begin{bmatrix} 1344 \\ \vdots \\ 1344 \end{bmatrix} - \begin{bmatrix} 3 \\ 2 \\ \vdots \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 3 \\ \vdots \\ 3 \end{bmatrix}$

$R_5 = \cancel{y_5 - y_5} - hf = [-2 \dots -2]^T$

$R_6 = y_5 - y_4 - hf = \begin{bmatrix} 1357 \\ \vdots \\ 1357 \end{bmatrix} - \begin{bmatrix} 1356 \\ \vdots \\ 1356 \end{bmatrix} - \begin{bmatrix} 3 \\ 2 \\ \vdots \\ 2 \end{bmatrix} = \begin{bmatrix} -1 \\ \vdots \\ -1 \end{bmatrix}$