BEHAVIOR OF THE SOLUTION SEQUENCE $\{y_k\}$

$$y_{k+1} = Ay_k + B \qquad k = 0, 1, 2, \cdots$$

	Hypotheses			Conclusions	
Row	A	B	$\mathbf{y}_0$	for $k = 1, 2, 3, \cdots$	the sequence $\{\mathbf{y}_k\}$ is
(a)	$A \neq 1$		$\mathbf{y}_0 = \mathbf{y}^*$	$\mathbf{y}_k = \mathbf{y}^*$	constant ($=\mathbf{y}^*$)
(b)	$A > 1$		$\mathbf{y}_0 > \mathbf{y}^*$	$\mathbf{y}_k > \mathbf{y}^*$	monotone increasing, diverges to $+\infty$
(c)	$A > 1$		$\mathbf{y}_0 < \mathbf{y}^*$	$\mathbf{y}_k < \mathbf{y}^*$	monotone decreasing, diverges to $-\infty$
(d)	$0 < A < 1$		$\mathbf{y}_0 > \mathbf{y}^*$	$\mathbf{y}_k > \mathbf{y}^*$	monotone decreasing, converges to limit $\mathbf{y}^*$
(e)	$0 < A < 1$		$\mathbf{y}_0 < \mathbf{y}^*$	$\mathbf{y}_k < \mathbf{y}^*$	monotone increasing, converges to limit $\mathbf{y}^*$
(f)	$-1 < A < 0$		$\mathbf{y}_0 \neq \mathbf{y}^*$		damped oscillatory, converges to limit $\mathbf{y}^*$
(g)	$A = -1$		$\mathbf{y}_0 \neq \mathbf{y}^*$		divergent, oscillates finitely
(h)	$A < -1$		$\mathbf{y}_0 \neq \mathbf{y}^*$		divergent, oscillates infinitely
(i)	$A = 1$	$B = 0$		$\mathbf{y}_k = \mathbf{y}_0$	constant ($=\mathbf{y}_0$)
(j)	$A = 1$	$B > 0$		$\mathbf{y}_k > \mathbf{y}_0$	monotone increasing, diverges to $+\infty$
(k)	$A = 1$	$B < 0$		$\mathbf{y}_k < \mathbf{y}_0$	monotone decreasing, diverges to $-\infty$