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> #Please do not post homework
  #Shreya Ghosh, 10-11-2021, Assignment 10
> #1.
  #x = x/(x+c) -> x^2 + x(c-1) = 0 -> x(x+c-1) = 0
  #x+c - 1 = 0 -> x = 1-c

      #x = 0, 1-c -> 0 is alway a fixed point because if x[n-1] is 0 then, x[n] is always 0 since x
      [n-1] is in the numerator
  #f'(x) = ((x+c)-x)/(x+c)^2 = c/(x+c)^2
  #f'(0) = c/c^2 = 1/c -> 0 is a fixed point for any value of c except c = 0
  #f'(1-c)= c/(1-c+c)^2 = c -> 1 - c is a fixed point for -1 < c < 1
> #2i. (x, y) -> (((-16)/3)x + 5y, -7x + (13/2)y)
  #((-16/3) - l)((13/2) - l) + 35 = 0
  #l^2 - (7/6)l + 1/3 = 0 -> l = 2/3, 1/2 < 1 -> stable fixed point
> #2ii. (x, y) -> ((92/3)x - 25y, 35x - (57/2)y)
  #((92/3) - l)((-57/2) - l) + 875 = 0
  #l^2 - (13/6)l + 1 = 0 -> l = 3/2, 2/3 -> 3/2 > 1 -> not a stable fixed point
> #2iii. (x, y) -> (((-177)/4)x + (75/2)y, ((-105)/2)x + (89/2)y)
  #((-177/4) - l)((89/2) - l) + 7875/4 = 0
  #l^2 - (1/4)l - 3/8 = 0 -> l = 3/4, -1/2 -> -1 < 3/4, -1/2 < 1 -> stable fixed point
> with(LinearAlgebra)
[&x, Add, Adjoint, BackwardSubstitute, BandMatrix, Basis, BezoutMatrix, BidiagonalForm,        (1)
  BilinearForm, CARE, CharacteristicMatrix, CharacteristicPolynomial, Column,
  ColumnDimension, ColumnOperation, ColumnSpace, CompanionMatrix,
  CompressedSparseForm, ConditionNumber, ConstantMatrix, ConstantVector, Copy,
  CreatePermutation, CrossProduct, DARE, DeleteColumn, DeleteRow, Determinant, Diagonal,
  DiagonalMatrix, Dimension, Dimensions, DotProduct, EigenConditionNumbers, Eigenvalues,
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Eigenvectors, *Equal*, *ForwardSubstitute*, *FrobeniusForm*, *FromCompressedSparseForm*, *FromSplitForm*, *GaussianElimination*, *GenerateEquations*, *GenerateMatrix*, *Generic*, *GetResultDataType*, *GetResultShape*, *GivensRotationMatrix*, *GramSchmidt*, *HankelMatrix*, *HermiteForm*, *HermitianTranspose*, *HessenbergForm*, *HilbertMatrix*, *HouseholderMatrix*, *IdentityMatrix*, *IntersectionBasis*, *IsDefinite*, *IsOrthogonal*, *IsSimilar*, *IsUnitary*, *JordanBlockMatrix*, *JordanForm*, *KroneckerProduct*, *LA_Main*, *LUDecomposition*, *LeastSquares*, *LinearSolve*, *LyapunovSolve*, *Map*, *Map2*, *MatrixAdd*, *MatrixExponential*, *MatrixFunction*, *MatrixInverse*, *MatrixMatrixMultiply*, *MatrixNorm*, *MatrixPower*, *MatrixScalarMultiply*, *MatrixVectorMultiply*, *MinimalPolynomial*, *Minor*, *Modular*, *Multiply*, *NoUserValue*, *Norm*, *Normalize*, *NullSpace*, *OuterProductMatrix*, *Permanent*, *Pivot*, *PopovForm*, *ProjectionMatrix*, *QRDecomposition*, *RandomMatrix*, *RandomVector*, *Rank*, *RationalCanonicalForm*, *ReducedRowEchelonForm*, *Row*, *RowDimension*, *RowOperation*, *RowSpace*, *ScalarMatrix*, *ScalarMultiply*, *ScalarVector*, *SchurForm*, *SingularValues*, *SmithForm*, *SplitForm*, *StronglyConnectedBlocks*, *SubMatrix*, *SubVector*, *SumBasis*, *SylvesterMatrix*, *SylvesterSolve*, *ToeplitzMatrix*, *Trace*, *Transpose*, *TridiagonalForm*, *UnitVector*, *VandermondeMatrix*, *VectorAdd*, *VectorAngle*, *VectorMatrixMultiply*, *VectorNorm*, *VectorScalarMultiply*, *ZeroMatrix*, *ZeroVector*, *Zip*]

> $m1 := \left[\left[-\frac{16}{3}\cdot 0.3, 5\cdot 0.6\right], \left[-7\cdot 0.3, \frac{13}{2}\cdot 0.6\right]\right]$

$$m1 := [[-1.600000000, 3.0], [-2.1, 3.900000000]] \quad (2)$$

> $evalm(m1^{1000})$

$$\begin{bmatrix} -3.763553199 \times 10^{356} & 6.942161054 \times 10^{356} \\ -4.859512771 \times 10^{356} & 8.963742121 \times 10^{356} \end{bmatrix} \quad (3)$$

> $m2 := \left[\left[-\frac{92}{3}\cdot 0.3, -25\cdot 0.6\right], \left[35\cdot 0.3, -\frac{57}{2}\cdot 0.6\right]\right]$

$$m2 := [[-9.200000000, -15.0], [10.5, -17.10000000]] \quad (4)$$

> $evalm(m2^{1000})$

$$\begin{bmatrix} 3.768602543 \times 10^{1248} & 1.069093184 \times 10^{1249} \\ -7.483652276 \times 10^{1248} & 9.399159968 \times 10^{1248} \end{bmatrix} \quad (5)$$

> $m3 := \left[\left[-\frac{177}{4}\cdot 0.3, \frac{75}{2}\cdot 0.6\right], \left[-\frac{105}{2}\cdot 0.3, \frac{89}{2}\cdot 0.6\right]\right]$

$$m3 := [[-13.27500000, 22.50000000], [-15.75000000, 26.70000000]] \quad (6)$$

> $evalm(m3^{1000})$

$$\begin{bmatrix} -1.178923817 \times 10^{1128} & 1.998932780 \times 10^{1128} \\ -1.399252944 \times 10^{1128} & 2.372513420 \times 10^{1128} \end{bmatrix} \quad (7)$$

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