

```

> #HW 10 - Alan Ho
> #OK to post
>
> #2i)
> with(LinearAlgebra)
[&x, Add, Adjoint, BackwardSubstitute, BandMatrix, Basis, BezoutMatrix, BidiagonalForm,
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, 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]

```

(1)

```

> m := linalg[matrix](2, 2, [-16/3 * 0.3, 5 * 0.6, -7 * 0.3, 13/2 * 0.6])
m := [ -1.600000000    3.0
      -2.1          3.900000000 ]

```

(2)

```

> evalm(m1000)
[ -3.763553199 × 10356  6.942161054 × 10356
  -4.859512771 × 10356  8.963742121 × 10356 ]

```

(3)

$$\begin{aligned}
 &> \#2ii) \\
 &> m2 := \text{linalg}[\text{matrix}]\left(2, 2, \left[\frac{92}{3} \cdot 0.3, -25 \cdot 0.6, 35 \cdot 0.3, -\frac{57}{2} \cdot 0.6\right]\right) \\
 &\quad m2 := \begin{bmatrix} 9.200000000 & -15.0 \\ 10.5 & -17.10000000 \end{bmatrix} \tag{4}
 \end{aligned}$$

$$\begin{aligned}
 &> \text{evalm}(m2^{1000}) \\
 &\quad \begin{bmatrix} -2.746777136 \times 10^{896} & 4.467345034 \times 10^{896} \\ -3.127141521 \times 10^{896} & 5.085967826 \times 10^{896} \end{bmatrix} \tag{5}
 \end{aligned}$$

$$\begin{aligned}
 &> \#2iii) \\
 &> m3 := \text{linalg}[\text{matrix}]\left(2, 2, \left[-\frac{177}{4} \cdot 0.3, \frac{75}{2} \cdot 0.6, \frac{-105}{2} \cdot 0.3, \frac{89}{2} \cdot 0.6\right]\right) \\
 &\quad m3 := \begin{bmatrix} -13.27500000 & 22.50000000 \\ -15.75000000 & 26.70000000 \end{bmatrix} \tag{6}
 \end{aligned}$$

$$\begin{aligned}
 &> \text{evalm}(m3^{1000}) \\
 &\quad \begin{bmatrix} -1.178923817 \times 10^{1128} & 1.998932780 \times 10^{1128} \\ -1.399252944 \times 10^{1128} & 2.372513420 \times 10^{1128} \end{bmatrix} \tag{7}
 \end{aligned}$$