ASTU PCE6301 Identification \_ Section1 Midterm exam 2020/12/14

Name ID

1. Given
   1. Find eigenvalues and eigenvectors of

**Sol:**

* 1. Define , find eigenvalues and eigenvectors

**Sol**:

Since -->

* 1. Find the solution to the differential equation,

**Sol:**

Hence

* 1. Find the solution to the differential equation,

**Sol:**

1. Given
   1. Find eigenvalues and eigenvectors of

**Sol:**

* 1. Find eigenvalues and eigenvectors of

**Sol:**



🡪 e-value of and e-vectors

1. 🡪 e-value of and e-vectors
   1. Find the solution to the differential equation at k = 10

**Sol**:

Hence

* 1. Find the solution to the differential equation at k = 10;

**Sol:**

1. A door is opened between rooms that hold people, and people. The movement between rooms in proportional to the difference

3.1) show that is constant (70people).

**Sol:**

3.2) Find

**Sol**:

Hence

1. Find the best line (find C and D) to fit at times .

**Sol:**



1. Find the projection vector the vector onto the line
2. b)

Sol: Projection b on a =

S-a)

S-b)

1. Given
   1. Find eigenvalues of

Sol :

* 1. Find eigenvalues of

Sol : Since e-values of and are same upto non-zero, hence e-values of = 1,3,0

* 1. Find SVD matrixes which depose of A as

Sol:

* 1. Let Find

Sol:

Hence

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ASTU PCE6301 Identification \_ Section2 Midterm exam 2020/12/14

Name ID

1. Given
   1. Find eigenvalues and eigenvectors of

**Sol:**

e-vector =

* 1. Define , find eigenvalues and eigenvectors of B

Sol:

e-vector =

* 1. Find the solution to the differential equation,

Sol:

* 1. When converges to infinity, with which initial condition gives a finite solution?

Sol:

Since which is convergent to zero as t converge to infinity, hence with the initial conditions

, the solution should be convergent to zero

1. Given
   1. Find eigenvalues and eigenvectors of

Sol:

Hence corresponding e-vectors as

* 1. Find eigenvalues and eigenvectors of

Sol:

e-values of corresponding e-vectors

e-values of corresponding e-vectors

* 1. Find the steady state solution when k converges to infinity with the initial point

Sol:

With the initial conditions

Hence the solution to the problem is

* 1. Find the steady state solution when k converges to infinity with the initial point

Sol:

Hence

1. Find the best line (find C and D) to fit at times

Sol:

And find the error (. If the error is zero, explain why the error is zero.

Sol\_1:

Sol\_2

Since

So that

1. For given matrix . Let define the energy . Write as a sum of squares as

Sol: Let

Since is a symmetric function;

Therefore if , then

Which implies is a sum of square form.

Sol\_A: and e-vectors are =

Then is

Sol\_B: and e-vectors are =

Then is

1. Show that the following matrix fails to

Is not positive when

Sol:

is not positive

1. Given
   1. Find eigenvalues of

Sol:

* 1. Find eigenvalues of

Sol: Since upto non-zero values

4,8,0

* 1. Find SVD matrixes which depose of A as

Sol:

* 1. Let Find

Sol: