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Scilab operations

Tenet Technetronics is official Training Partners for



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Chapter 1

Predefined Constants & Variables in Scilab

Scilab denotes predefined variables. Few are given below.

Symbol	Scilab denote	example
π	%Pi	<code>sin(%pi)</code>
ϵ	%eps	<code>1 + (%eps / 2) == 1</code>
∞	%inf	<code>A = %inf</code>
i	%i	<code>2 + 3 * %i</code>
e	%e	<code>log(%e)</code>
A variable used to define polynomials.	%s	<code>p = %s^2 + 2 * %s + 1</code>

Chapter 2

Vector Operations in Scilab

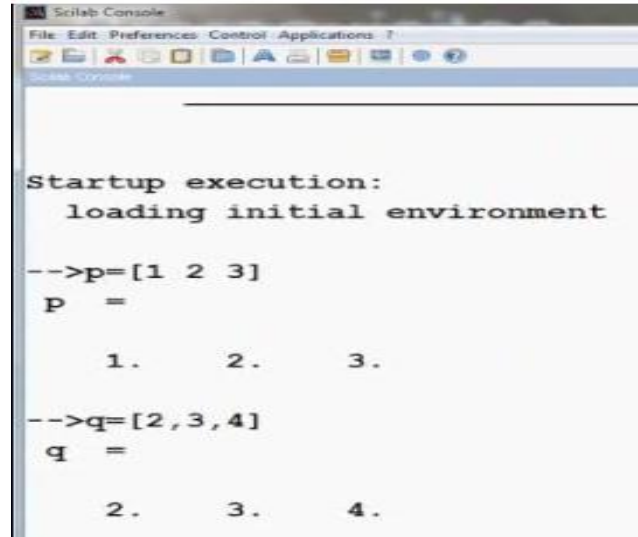
1. To define vector
2. Length of vector
3. Transpose of vector
4. Basic arithmetic operations in vector



1. In scilab to define vector there are two ways

a) $p = [1 \ 2 \ 3]$

b) $q = [2,3,4]$



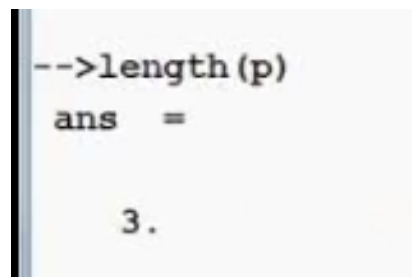
```
Scilab Console
File Edit Preferences Control Applications ?
Startup execution:
loading initial environment

-->p=[1 2 3]
p =
    1.    2.    3.

-->q=[2,3,4]
q =
    2.    3.    4.
```

2. To find the length of the vector. Use the command.

✓ $\text{Length}(p)$



```
-->length(p)
ans =
    3.
```

3. To transpose a vector. Let p be a vector and its transpose is

✓ p'

```
-->p'
ans =

    1.
    2.
    3.
```

4. Basic arithmetic operation of vector

1. $p + q$
2. $q - p$
3. $p' * q$

```
-->p+q
ans =

    3.    5.    7.

-->q-p
ans =

    1.    1.    1.
```

```
-->p' * q
ans =

    2.    3.    4.
    4.    6.    8.
    6.    9.   12.
```



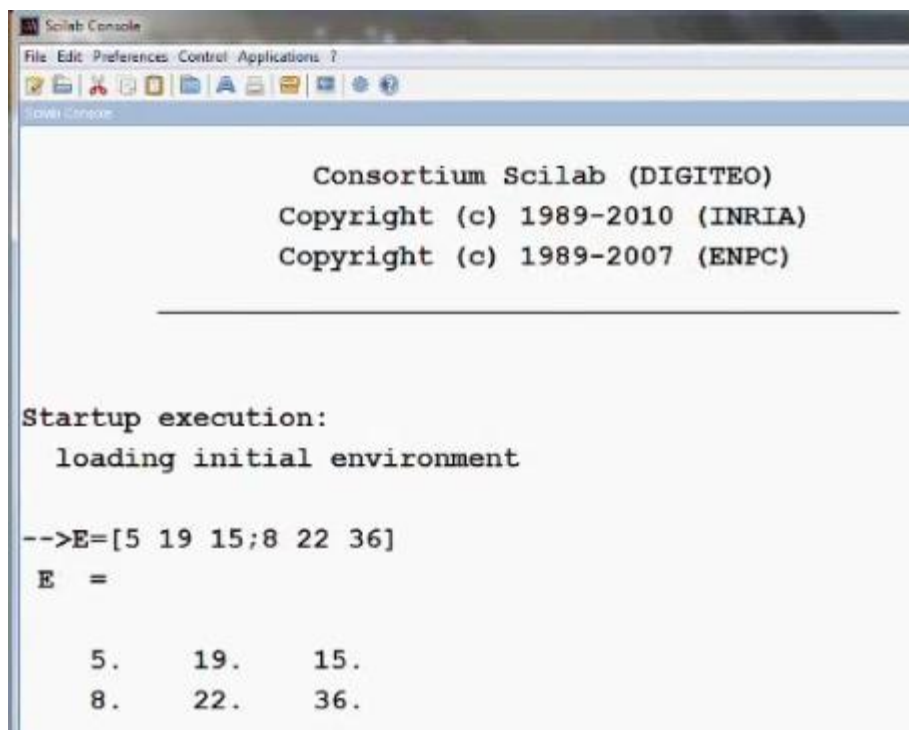
Chapter 3

Matrix operations in Scilab

1. Define matrix in Scilab
2. Address rows & columns
3. Determinant of matrix
4. Inverse matrix & eigen value of matrix
5. Square & cube of matrix
6. Zero's, one's & identity matrix in Scilab

1. To define matrix in Scilab

✓ $E = \begin{bmatrix} 5 & 19 & 15 \\ 8 & 22 & 36 \end{bmatrix}$



```
Scilab Console
File Edit Preferences Control Applications ?
Startup execution:
loading initial environment
-->E=[5 19 15;8 22 36]
E =

    5.    19.    15.
    8.    22.    36.
```

2. To address the individual elements of matrix & extract of last column of matrix.

✓ $E(1,2)$

```
-->E(1,2)
ans =

    19.
```

✓ $\text{Elastcol}=E(:,\$)$

```
-->Elastcol=E(:, $)
Elastcol =

    15.
    36.
```

3. To calculate the determinant of matrix

✓ $A=[1 \ 2 \ -1 \ ; \ -2 \ -6 \ 4 \ ; \ -1 \ -3 \ 3]$

✓ $\det(A)$

```
-->A=[1 2 -1;-2 -6 4;-1 -3 3]
A =

     1.     2.    - 1.
    - 2.    - 6.     4.
    - 1.    - 3.     3.

-->det(A)
ans =

    - 2.
```



4. To calculate the inverse and eigen value of matrix.

✓ `inv(A)`

✓ `spec(A)` denote eigen value of matrix

```
-->inv(A)
ans =

    3.    1.5   - 1.
   - 1.   - 1.    1.
    0.   - 0.5    1.

-->spec(A)
ans =

- 3.7448261
 0.3959319
 1.3488942
```

5. To find square and cube of matrix

```
-->A^2
ans =

- 2.   - 7.    4.
  6.   20.   - 10.
  2.    7.   - 2.

-->A^3
ans =

  8.    26.   - 14.
 - 24.   - 78.    44.
 - 10.   - 32.    20.
```



6. To create zeros, ones and identity matrix in scilab

- ✓ Zeros (3,4)
- ✓ Ones(2,4)
- ✓ Identity matrix denotes 'eye()'

```
-->zeros(3,4)
ans =

    0.    0.    0.    0.
    0.    0.    0.    0.
    0.    0.    0.    0.

-->ones(2,4)
ans =

    1.    1.    1.    1.
    1.    1.    1.    1.
```

```
-->eye(4,4)
ans =

    1.    0.    0.    0.
    0.    1.    0.    0.
    0.    0.    1.    0.
    0.    0.    0.    1.
```



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