Close

Octave Tutorial

5 questions

1.

Suppose I first execute the following Octave commands:

A = [1 2; 3 4; 5 6];

B = [1 2 3; 4 5 6];

Which of the following are then valid Octave commands? Check all that apply and assume all options are written in an Octave command. (Hint: A' denotes the transpose of A.)



C = A \* B;



C = B' + A;



C = A' \* B;



C = B + A;

2.

Question text

Let *A*=⎡⎣⎢⎢16594211714310615138121⎤⎦⎥⎥.

Which of the following indexing expressions gives *B*=⎡⎣⎢⎢16594211714⎤⎦⎥⎥? Check all that apply.



B = A(:, 1:2);



B = A(1:4, 1:2);



B = A(0:2, 0:4)



B = A(1:2, 1:4);

3.

Let *A* be a 10x10 matrix and *x* be a 10-element vector. Your friend wants to compute the product *Ax* and writes the following code:

v = zeros(10, 1);

for i = 1:10

for j = 1:10

v(i) = v(i) + A(i, j) \* x(j);

end

end

How would you vectorize this code to run without any FOR loops? Check all that apply.



v = A \* x;



v = Ax;



v = A .\* x;

// 10 \* 10



v = sum (A \* x);

4.

Say you have two column vectors *v* and *w*, each with 7 elements (i.e., they have dimensions 7x1). Consider the following code:

z = 0;

for i = 1:7

z = z + v(i) \* w(i)

end

Which of the following vectorizations correctly compute z? Check all that apply.



z = sum (v .\* w);



z = w' \* v;



z = v \* w;



z = w \* v;

5.

In Octave, many functions work on single numbers, vectors, and matrices. For example, the sin function when applied to a matrix will return a new matrix with the sin of each element. But you have to be careful, as certain functions have different behavior. Suppose you have an 7x7 matrix *X*. You want to compute the log of every element, the square of every element, add 1 to every element, and divide every element by 4. You will store the results in four matrices, *A*,*B*,*C*,*D*. One way to do so is the following code:

for i = 1:7

for j = 1:7

A(i, j) = log(X(i, j));

B(i, j) = X(i, j) ^ 2;

C(i, j) = X(i, j) + 1;

D(i, j) = X(i, j) / 4;

end

end

Which of the following correctly compute *A*,*B*,*C*, or *D*? Check all that apply.



C = X + 1;



D = X / 4;



A = log (X);



B = X ^ 2;

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