

Numpy Arrays: problem set

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For all these programs start with importing numpy (`from numpy import *`)

1. Create a numpy array with the following characteristics
 - 0 to 100 in intervals of 5
 - 0 to 1 with interval 0.1
 - 100 to 10 in interval of -5
2. Create the following :
 - A null vector of size 10 but the fifth value which is 1
 - A 4x4 matrix with values ranging from 0 to 15 (Hint : create a 1D array and then reshape it.
 - A 4x4 Identity matrix
 - A 3x3 matrix with uniform random values between 2 to 5 (Hint: numpy gives random numbers b/w [0,1] . Convert it into 2 to 5 by linear transformation (y=mx+c))
3. As in the above question, declare a 3x3 array with uniform random values between 2 and 5, and find the minimum and maximum values by writing a program and by using inbuilt function (`xmin = x.min()`, `xmax=x.max()`). Compare the two
4. Multiply a 5x3 matrix of ones by a 3x3 matrix created above
5. Create a random vector of size 10 and sort it in ascending order , first by using your sorting program and then by inbuilt function `sort()`
6. Consider a random 10x2 matrix representing cartesian coordinates, convert them to polar coordinates (Hint: after getting r, θ columns, append them by zip function)

With inputs from : <http://www.loria.fr/~rougier/teaching/numpy/numpy.html>