PYTHON PROBLEMS

1. Import the numpy package under the name `np`

2. Print the numpy version and the configuration

3. Create a null vector of size 10

4. How to find the memory size of any array

5. How to get the documentation of the numpy add function from the command line?

6. Create a null vector of size 10 but the fifth value which is 1

7. Create a vector with values ranging from 10 to 49

8. Reverse a vector (first element becomes last)

9. Create a 3x3 matrix with values ranging from 0 to 8

10. Find indices of non-zero elements from [1,2,0,0,4,0]

11. Create a 3x3 identity matrix

12. Create a 3x3x3 array with random values

13. Create a 10x10 array with random values and find the minimum and maximum values

14. Create a random vector of size 30 and find the mean value

15. Create a 2d array with 1 on the border and 0 inside

16. How to add a border (filled with 0's) around an existing array?

17. What is the result of the following expression?

```
0 * np.nan
np.nan == np.nan
np.inf > np.nan
np.nan - np.nan
np.nan in set([np.nan])
0.3 == 3 * 0.1
```

18. Create a 5x5 matrix with values 1,2,3,4 just below the diagonal

19. Create a 8x8 matrix and fill it with a checkerboard pattern

20. Consider a (6,7,8) shape array, what is the index (x,y,z) of the 100th element?

21. Create a checkerboard 8x8 matrix using the tile function

22. Normalize a 5x5 random matrix

23. Create a custom dtype that describes a color as four unsigned bytes (RGBA)

24. Multiply a 5x3 matrix by a 3x2 matrix (real matrix product)

25. Given a 1D array, negate all elements which are between 3 and 8, in place.

26. What is the output of the following script?

```
# Author: Jake VanderPlas

print(sum(range(5),-1))
from numpy import *
print(sum(range(5),-1))
```

27. Consider an integer vector Z, which of these expressions are legal?

```
Z**Z
2 << Z >> 2
Z <- Z
1j*Z
Z/1/1
Z<Z>Z
```

28. What are the result of the following expressions?

```
np.array(0) / np.array(0)
np.array(0) // np.array(0)
np.array([np.nan]).astype(int).astype(float)
```

29. How to round away from zero a float array ?

30. How to find common values between two arrays?