

Imagine you are given an array of data with N rows and 3 columns containing data on the weight, height, and age of subjects in your study. A few rows of the table are illustrated below but the real table would have many more rows.

	Weight (kg)	Height (m)	Age (years)
0	93.6	1.8	55
1	46.3	1.6	19
...	...	...	...
N-1	75.3	1.9	23

Show the expressions you would write to answer the following questions assuming numpy has been imported as np and pylab has been imported as well.

1. How many of the subjects are 18 or older?
2. What is the Body Mass Index of each subject? (The formula for BMI is weight divided by the square of height)
3. What is the average height of subjects older than 25?
4. How many subjects weigh more than 1 standard deviation more than the average?

In the next set of questions, give me the **shape** of the array that results from the computation. (Hint: the answer to the first one is 2 x 3).

5. \_\_\_\_\_ `A = np.array([[1,5,9],[4,2,3]])`
6. \_\_\_\_\_ `B = A.T`
7. \_\_\_\_\_ `C = np.arange(0,9,2)`
8. \_\_\_\_\_ `D = np.ones( (6,1) )`
9. \_\_\_\_\_ `E = np.array([A,A])`
10. \_\_\_\_\_ `F = A[1,1] - np.random.rand(5)`
11. \_\_\_\_\_ `G = np.identity(3) + np.array([4, 5, 6] )`
12. \_\_\_\_\_ `H = A[[1, 1, 1, 1], :]`
13. \_\_\_\_\_ `I = np.dot ( np.random.rand(3,2) , A )`
14. \_\_\_\_\_ `J = np.random.rand(3,2) * (A.T)`

In this next set give me the value that will be printed.

15. \_\_\_\_\_ `c = np.zeros((4,4)); c[:,2::2] = 1; c[1::2,1::2] = 1; c`

16. \_\_\_\_\_ `c = np.identity(4).T; c`