Q1. What are the benefits of the built-in array package, if any?

**Ans:** Get the Type Code. Since the type of code is very important to an array, which determined what kind of elements that the array can have.

* Get Size of Array Item.
* Count the Number of Occurrences.
* Append and extend.
* Manipulating the Index.
* Array to List.

Q2. What are some of the array package's limitations?

**Ans:** They can be useful when we must manipulate only a specific data type value. A user can treat lists as arrays. However, user cannot constraint the type of elements stored in a list. If you create arrays using the array module, all elements of the array must be of the same type.

Q3. Describe the main differences between the array and NumPy packages.

**Ans:** NumPy arrays have a fixed size at creation, unlike Python lists (which can grow dynamically). Changing the size of a ND array will create a new array and delete the original. The elements in a NumPy array are all required to be of the same data type, and thus will be the same size in memory. It provides a high-performance multidimensional array object, and tools for working with these arrays. A NumPy array is a grid of values, all the same type, and is indexed by a tuple of nonnegative integers. A list is the Python equivalent of an array but is resizable and can contain elements of different types.

Q4. Explain the distinctions between the empty, ones, and zeros functions.

**Ans:** Empty, unlike zeros, does not set the array values to zero, and may therefore be marginally faster. On the other hand, it requires the user to manually set all the values in the array and should be used with caution. Return a new array setting values to zero.

Q5. In the fromfunction function, which is used to construct new arrays, what is the role of the callable argument?

**Ans:** Function: [callable] The function is called with N parameters, where N is the rank of shape. Each parameter represents the coordinates of the array varying along a specific axis. shape: [(N, ) tuple of ints] Shape of the output array, which also determines the shape of the coordinate arrays passed to function.

Q6. What happens when a NumPy array is combined with a single-value operand (a scalar, such as an int or a floating-point value) through addition, as in the expression A + n?

**Ans:** To multiply array by scalar in python, you can use np. multiply () method.

Q7. Can array-to-scalar operations use combined operation-assign operators (such as += or \*=)? What is the outcome?

**Ans:** The Python += operator lets you add two values together and assign the resultant value to a variable. This operator is often referred to as the addition assignment operator. There may be a case where you want to add two values and assign the resulting value to a variable.

Q8. Does a NumPy array contain fixed-length strings? What happens if you allocate a longer string to one of these arrays?

**Ans:** The dtype of any NumPy array containing string values is the maximum length of any string present in the array. Once set, it will only be able to store new string having length not more than the maximum length at the time of the creation.

Q9. What happens when you combine two NumPy arrays using an operation like addition (+) or multiplication (\*)? What are the conditions for combining two NumPy arrays?

**Ans:** Add () function is used when we want to compute the addition of two array. It adds arguments elementwise. If shape of two arrays is not same, that is arr1. shape, they must be broadcast able to a common shape (which may be the shape of one or the other). If both a and b are 2-D arrays, it is matrix multiplication, but using matmul or a @ b is preferred. If either a or b is 0-D (scalar), it is equivalent to multiply and using NumPy. multiply (a, b) or a \* b is preferred. If a is an N-D array and b is a 1-D array, it is a sum product over the last axis of a and b.

Q10. What is the best way to use a Boolean array to mask another array?

**Ans:** 1. Import the library.

1. Create a function for masking.
2. Masking can be done by following two approaches
3. Then return the masked from the function.
4. Now create the main function.
5. Create two arrays one for masking another.

Q11. What are three different ways to get the standard deviation of a wide collection of data using both standard Python and its packages? Sort the three of them by how quickly they execute.

**Ans:** Using Python's pstdev() and stdev(). The Python statistics module also provides functions to calculate the standard deviation. We can find pstdev() and stdev() . The first function takes the data of an entire population and returns its standard deviation.

12. What is the dimensionality of a Boolean mask-generated array?

**Ans:** Masking in python and data science is when you want manipulated data in a collection based on some criteria. The criteria you use is typically of a true or false nature, hence the Boolean part. A Boolean array is a NumPy array with Boolean (True/False) values. Such array can be obtained by applying a logical operator to another NumPy array: import NumPy as np a = np. reshape (np).