**Instructions to solve the Questions:**

**1. Explanation for each and every solution must be given in brief.**

**2. Screenshot for each and every step must be provided for questions involving practical implementation.**

**3. For theory/conceptual questions. Solutions having at least 1 practical implementation will be favoured.**

**1. What is a frozen set in Python?**

**2. When you exit Python, is all memory deallocated?**

**3. Explain garbage collection with Python.**

**4. What is the process to calculate percentiles with NumPy?**

**5. Explain different ways to create an empty NumPy array in Python.**

**6. How will you find, in a string, the first word that rhymes with ‘cake’?**

**7. Explain** How to create a series from a list, numpy array and dict?

8. How to get the items of series A not present in series B?

9.How to get the minimum, 25th percentile, median, 75th, and max of a numeric series?

10. How to keep only top 2 most frequent values as it is and replace everything else as ‘Other’?

11. How to bin a numeric series to 10 groups of equal size?

12. How to find the positions of numbers that are multiples of 3 from a series?

13. How to stack two series vertically and horizontally?

14. How to get the positions of items of series A in another series B?

15. How to compute the mean squared error on a truth and predicted series?

16. How to calculate the number of characters in each word in a series?

17. How to convert a series of date-strings to a timeseries?

18. How to filter valid emails from a series?

19.  How to compute the Euclidean distance between two series?

20. How to replace missing spaces in a string with the least frequent character?

21. How to create a TimeSeries starting ‘2000-01-01’ and 10 weekends (saturdays) after that having random numbers as values?

22. How to fill an intermittent time series so all missing dates show up with values of previous non-missing date?

23. How to import only every nth row from a csv file to create a dataframe?

24.  How to change column values when importing csv to a dataframe?

25. How to count the number of missing values in each column?

26. How to replace missing values of multiple numeric columns with the mean?

27. How to use apply function on existing columns with global variables as additional arguments?

28. How to find and cap outliers from a series or dataframe column?

29.  How to create a new column that contains the row number of nearest column by Euclidean distance?

30. How to create a column containing the minimum by maximum of each row?

31. How to normalize all columns in a dataframe?

32. How to compute the correlation of each row with the succeeding row?

33. How to replace both the diagonals of dataframe with 0?

34. How to get the particular group of a groupby dataframe by key?

35. How to get the particular group of a groupby dataframe by key?

36. How to compute grouped mean on pandas dataframe and keep the grouped column as another column (not index)?

37. How to join two dataframes by 2 columns so they have only the common rows?

38. How to get the positions where values of two columns match?

39. How to get the frequency of unique values in the entire dataframe?

40. How to split a text column into two separate columns?

41. How to compute the mean squared error on a truth and predicted series?

42. How to convert the first character of each element in a series to uppercase?

43. How to calculate the number of characters in each word in a series?

44. How to compute difference of differences between consecutive numbers of a series?

45. How to get the day of month, week number, day of year and day of week from a series of date strings?

46. How to filter words that contain at least 2 vowels from a series?

47. How to get frequency counts of unique items of a series?

44. How to compute difference of differences between consecutive numbers of a series?

45. How to get the day of month, week number, day of year and day of week from a series of date strings?

46. How to filter words that contain at least 2 vowels from a series?

47. How to get frequency counts of unique items of a series?

48. How to convert a numpy array to a dataframe of given shape?

49. How can we convert a Series to DataFrame?

50. How can we convert DataFrame into an excel file?

51.  Write a Python program to check if a specific Key and a value exist in a dictionary.

52. Write a Python program to get the total length of all values of a given dictionary with string values

53. Write a Python program to create a key-value list pairing in a given dictionary.

54. Write a Python program to convert a given list of lists to a dictionary.

55. Write a Python program to extract values from a given dictionaries and create a list of lists from those values.

56. Write a Python program to count the frequency in a given dictionary.

57.  Write a Python program to find the specified number of maximum values in a given dictionary.

58.  Write a Python program to get all combinations of key-value pairs in a given dictionary.

59. Write a Python program to filter even numbers from a given dictionary values.

60. A Python Dictionary contains List as value. Write a Python program to update the list values in the said dictionary.

61. A Python Dictionary contains List as value. Write a Python program to clear the list values in the said dictionary

62. Write a Python program to convert string values of a given dictionary, into integer/float datatypes

63. Write a Python program to remove a specified dictionary from a given list.

64. Write a Python program to split a given dictionary of lists into list of dictionaries.

65. Write a Python program to create a dictionary grouping a sequence of key-value pairs into a dictionary of lists

66. Write a Python program to filter the height and width of students, which are stored in a dictionary.

### Original Dictionary: {'Cierra Vega': (6.2, 70), 'Alden Cantrell': (5.9, 65), 'Kierra Gentry': (6.0, 68), 'Pierre Cox': (5.8, 66)} Height > 6ft and Weight> 70kg: {'Cierra Vega': (6.2, 70)}

### 67. Write a Python program to convert more than one list to nested dictionary.

### 68.  Write a Python program to filter a dictionary based on values

### 69. Write a Python program to drop empty Items from a given Dictionary

### 70. Write a Python program to create a dictionary of keys x, y, and z where each key has as value a list from 11-20, 21-30, and 31-40 respectively. Access the fifth value of each key from the dictionary.

### 71. Write a Python program to store a given dictionary in a json file

### 72. Write a Python program to match key values in two dictionaries.

### 73. Write a Python program to replace dictionary values with their average.

### 74. Write a Python program to get the top three items in a shop.

### 75. Write a Python program to create a dictionary from a string.

## Note: Track the count of the letters from the string.

## 76. Write a Python program to find the highest 3 values of corresponding keys in a dictionary

## 77. Write a Python program to create and display all combinations of letters, selecting each letter from a different key in a dictionary.

## 78. Write a Python program to print all unique values in a dictionary

## 79. Write a Python program to combine two dictionary adding values for common keys

## 80. Write a Python program to check a dictionary is empty or not

## 81. Write a Python program to remove duplicates from Dictionary.

## 82. Write a Python program to get a dictionary from an object's fields.

## 83. Write a Python program to get the maximum and minimum value in a dictionary.

## 84. Write a Python script to sort (ascending and descending) a dictionary by value

## 85. Write a Python script to add a key to a dictionary.

## 86.  Write a Python script to concatenate following dictionaries to create a new one.

## 87. Write a Python script to check whether a given key already exists in a dictionary.

## 88.  Write a Python script to generate and print a dictionary that contains a number (between 1 and n) in the form (x, x\*x)

## 89. Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys

## 90. Write a Python script to merge two Python dictionaries.

## 91. Write a Python program to sum all the items in a dictionary.

## 92. Write a Python program to map two lists into a dictionary.

## 93. Write a Python program to multiply all the items in a dictionary

## 94. Write a Python program to remove a key from a dictionary.

### 95. Define ReIndexing.

### 96. Define Multiple Indexing?

### 97. How to Reset the index?

### 98. Describe Data Operations in Pandas?

### 99. Define GroupBy in Pandas?

### 100. What is Time Series in Pandas?

101. Write a Python program to split a list based on first character of word

102. Write a Python program to split a list into different variables.

103. Write a Python program to generate groups of five consecutive numbers in a list.

104. Write a Python program to convert a pair of values into a sorted unique array.

105. Write a Python program to select the odd items of a list.

106. Write a Python program to insert an element before each element of a list.

109. Write a Python program to print a nested lists (each list on a new line) using the print() function.

110. Write a Python program to convert list to list of dictionaries.    
Sample lists: ["Black", "Red", "Maroon", "Yellow"], ["#000000", "#FF0000", "#800000", "#FFFF00"]  
Expected Output: [{'color\_name': 'Black', 'color\_code': '#000000'}, {'color\_name': 'Red', 'color\_code': '#FF0000'}, {'color\_name': 'Maroon', 'color\_code': '#800000'}, {'color\_name': 'Yellow', 'color\_code': '#FFFF00'}]

111. Write a Python program to sort a list of nested dictionaries.

112. Write a Python program to split a list every Nth element.    
Sample list: ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n']  
Expected Output: [['a', 'd', 'g', 'j', 'm'], ['b', 'e', 'h', 'k', 'n'], ['c', 'f', 'i', 'l']]

113. Write a Python program to compute the difference between two lists.    
Sample data: ["red", "orange", "green", "blue", "white"], ["black", "yellow", "green", "blue"]  
Expected Output:  
Color1-Color2: ['white', 'orange', 'red']  
Color2-Color1: ['black', 'yellow']

114. Write a Python program to create a list with infinite elements.

115. Write a Python program to concatenate elements of a list

116. Write a Python program to remove key values pairs from a list of dictionaries.

117. Write a Python program to convert a string to a list.

118. Write a Python program to check whether all items of a list is equal to a given string.

119. Write a Python program to replace the last element in a list with another list   
Sample data : [1, 3, 5, 7, 9, 10], [2, 4, 6, 8]  
Expected Output: [1, 3, 5, 7, 9, 2, 4, 6, 8]

120. Write a Python program to check whether the nth element exists in a given list.

121. Write a Python program to find a tuple, the smallest second index value from a list of tuples.

122. Write a Python program to create a list of empty dictionaries.

123. Write a Python program to print a list of space-separated elements.

124. Write a Python program to insert a given string at the beginning of all items in a list.  Sample list : [1,2,3,4], string : emp  
Expected output : ['emp1', 'emp2', 'emp3', 'emp4']

125. Write a Python program to iterate over two lists simultaneously.

126. Write a Python program to move all zero digits to end of a given list of numbers.  Expected output:  
Original list:  
[3, 4, 0, 0, 0, 6, 2, 0, 6, 7, 6, 0, 0, 0, 9, 10, 7, 4, 4, 5, 3, 0, 0, 2, 9, 7, 1]  
Move all zero digits to end of the said list of numbers:  
[3, 4, 6, 2, 6, 7, 6, 9, 10, 7, 4, 4, 5, 3, 2, 9, 7, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0]

127. Write a Python program to find the list in a list of lists whose sum of elements is the highest. [Go](https://www.w3resource.com/python-exercises/list/#EDITOR)  
Sample lists: [1,2,3], [4,5,6], [10,11,12], [7,8,9]  
Expected Output: [10, 11, 12]

128. Write a Python program to find all the values in a list are greater than a specified number.

129. Write a Python program to extend a list without append.    
Sample data: [10, 20, 30]  
[40, 50, 60]  
Expected output : [40, 50, 60, 10, 20, 30]

130. Write a Python program to remove duplicates from a list of lists.  Sample list : [[10, 20], [40], [30, 56, 25], [10, 20], [33], [40]]  
New List : [[10, 20], [30, 56, 25], [33], [40]]

131. Write a Python program to get the depth of a dictionary.    
Expected Output:  
Original list:  
['abcd', 'abc', 'bcd', 'bkie', 'cder', 'cdsw', 'sdfsd', 'dagfa', 'acjd']  
Items start with a from the said list:  
['abcd', 'abc', 'acjd']  
Items start with d from the said list:  
['dagfa']  
Items start with w from the said list:  
[]

132. Write a Python program to check whether all dictionaries in a list are empty or not.  Sample list : [{},{},{}]  
Return value : True  
Sample list : [{1,2},{},{}]  
Return value : False

133. Write a Python program to flatten a given nested list structure.    
Original list: [0, 10, [20, 30], 40, 50, [60, 70, 80], [90, 100, 110, 120]]  
Flatten list:  
[0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120]

134. Write a Python program to remove consecutive duplicates of a given list.    
Original list:  
[0, 0, 1, 2, 3, 4, 4, 5, 6, 6, 6, 7, 8, 9, 4, 4]  
After removing consecutive duplicates:  
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 4]

135. Write a Python program to pack consecutive duplicates of a given list elements into sublists.  Original list:  
[0, 0, 1, 2, 3, 4, 4, 5, 6, 6, 6, 7, 8, 9, 4, 4]  
After packing consecutive duplicates of the said list elements into sublists:  
[[0, 0], [1], [2], [3], [4, 4], [5], [6, 6, 6], [7], [8], [9], [4, 4]]

136. Write a Python program to create a list reflecting the run-length encoding from a given list of integers or a given list of characters.  Original list:  
[1, 1, 2, 3, 4, 4.3, 5, 1]  
List reflecting the run-length encoding from the said list:  
[[2, 1], [1, 2], [1, 3], [1, 4], [1, 4.3], [1, 5], [1, 1]]  
Original String:  
automatically  
List reflecting the run-length encoding from the said string:  
[[1, 'a'], [1, 'u'], [1, 't'], [1, 'o'], [1, 'm'], [1, 'a'], [1, 't'], [1, 'i'], [1, 'c'], [1, 'a'], [2, 'l'], [1, 'y']]

137. Write a Python program to create a list reflecting the modified run-length encoding from a given list of integers or a given list of characters.    
Original list:  
[1, 1, 2, 3, 4, 4, 5, 1]  
List reflecting the modified run-length encoding from the said list:  
[[2, 1], 2, 3, [2, 4], 5, 1]  
Original String:  
aabcddddadnss  
List reflecting the modified run-length encoding from the said string:  
[[2, 'a'], 'b', 'c', [4, 'd'], 'a', 'd', 'n', [2, 's']]

138. Write a Python program to decode a run-length encoded given list   
Original encoded list:  
[[2, 1], 2, 3, [2, 4], 5, 1]  
Decode a run-length encoded said list:  
[1, 1, 2, 3, 4, 4, 5, 1]

139. Write a Python program to split a given list into two parts where the length of the first part of the list is given.   
Original list:  
[1, 1, 2, 3, 4, 4, 5, 1]  
Length of the first part of the list: 3  
Splited the said list into two parts:  
([1, 1, 2], [3, 4, 4, 5, 1])

140. Write a Python program to pair up the consecutive elements of a given list.

Original lists:  
[1, 2, 3, 4, 5, 6]  
Pair up the consecutive elements of the said list:  
[[1, 2], [2, 3], [3, 4], [4, 5], [5, 6]]  
Original lists:  
[1, 2, 3, 4, 5]  
Pair up the consecutive elements of the said list:  
[[1, 2], [2, 3], [3, 4], [4, 5]]

141. Write a Python program to check if a given string contains an element, which is present in a list

142.  Write a Python program to find the indexes of all None items in a given list

143. Write a Python program to join adjacent members of a given list

144. Write a Python program to check if first digit/character of each element in a given list is same or not

145. Write a Python program to find the indices of elements of a given list, greater than a specified value.

146. Write a Python program to remove additional spaces in a given list

147. Write a Python program to find the common tuples between two given lists

148. Sum a list of numbers. Write a Python program to sum the first number with the second and divide it by 2, then sum the second with the third and divide by 2, and so on.

149. Write a Python program to compute the average of nth elements in a given list of lists with different lengths

150. Write a Python program to remove all strings from a given list of tuples.

151. Write a NumPy program to get the powers of an array values element-wise

152. Write a NumPy program to get the element-wise remainder of an array of division.

153. Write a NumPy program to calculate the absolute value element-wise

154. Write a NumPy program to concatenate element-wise two arrays of string.

155. Write a NumPy program to repeat all the elements three times of a given array of string

156. Write a NumPy program to capitalize the first letter, lowercase, uppercase, swap case, title-case of all the elements of a given array.

157. Write a NumPy program to insert a space between characters of all the elements of a given array.

158. Write a NumPy program to encode all the elements of a given array in cp500 and decode it again.

159. Write a NumPy program to remove the leading and trailing whitespaces of all the elements of a given array.

160. Write a NumPy program to remove the leading whitespaces of all the elements of a given array.

161. Write a NumPy program to remove the trailing whitespaces of all the elements of a given array.

162. Write a NumPy program to split the element of a given array with spaces.

163. Write a NumPy program to make all the elements of a given string to a numeric string of 5 digits with zeros on its left

164. Write a Python program to find the maximum and minimum value of a given flattened array.

165. Write a NumPy program to get the minimum and maximum value of a given array along the second axis.

166. Write a NumPy program to calculate the difference between the maximum and the minimum values of a given array along the second axis

167. Write a NumPy program to compute the 80th percentile for all elements in a given array along the second axis.

168. Write a NumPy program to compute the median of flattened given array.

169. Write a NumPy program to compute the weighted of a given array.

170. Write a NumPy program to compute the mean, standard deviation, and variance of a given array along the second axis

171. Write a NumPy program to compute the covariance matrix of two given arrays

172. Write a NumPy program to compute cross-correlation of two given arrays

173. Write a NumPy program to compute Pearson product-moment correlation coefficients of two given arrays

174. Write a NumPy program to test element-wise of a given array for finiteness (not infinity or not Not a Number), positive or negative infinity, for NaN, for NaT (not a time), for negative infinity, for positive infinity.

175. Write a Python NumPy program to compute the weighted average along the specified axis of a given flattened array

176. Write a Python program to count number of occurrences of each value in a given array of non-negative integers

177. Write a NumPy program to compute the histogram of nums against the bins.

178. Write a NumPy program to sort a given array of shape 2 along the first axis, last axis and on flattened array.

179. Write a NumPy program to create a structured array from given student name, height, class and their data types. Now sort the array on height.

180. Write a NumPy program to create a structured array from given student name, height, class and their data types. Now sort by class, then height if class are equal.

181. Write a NumPy program to sort the student id with increasing height of the students from given students id and height. Print the integer indices that describes the sort order by multiple columns and the sorted data

182. Write a NumPy program to get the indices of the sorted elements of a given array.

183. Write a NumPy program to sort a given complex array using the real part first, then the imaginary part.

184. Write a NumPy program to partition a given array in a specified position and move all the smaller elements values to the left of the partition, and the remaining values to the right, in arbitrary order (based on random choice)

185. Write a NumPy program to sort the specified number of elements from beginning of a given array.

186. Write a NumPy program to display all the dates for the month of March, 2017

187. Write a NumPy program to get the dates of yesterday, today and tomorrow

188. Write a NumPy program to count the number of days of specific month

189. Write a NumPy program to create a 3x3x3 array with random values

190. Write a NumPy program to create a 5x5 array with random values and find the minimum and maximum values.

191. Write a NumPy program to create a random 10x4 array and extract the first five rows of the array and store them into a variable

192. Write a NumPy program to shuffle numbers between 0 and 10 (inclusive)

193. Write a NumPy program to normalize a 3x3 random matrix

194. Write a NumPy program to create a random vector of size 10 and sort it

195. Write a NumPy program to find the nearest value from a given value in an array

196. Write a NumPy program to check two random arrays are equal or not.

197. Write a NumPy program to create random vector of size 15 and replace the maximum value by -1,

198. Write a NumPy program to find point by point distances of a random vector with shape (10,2) representing coordinates.

199. Write a NumPy program to find the most frequent value in an array.

200. Write a NumPy program to convert cartesian coordinates to polar coordinates of a random 10x2 matrix representing cartesian coordinates