Midterm Assignment

Problem - 1

Write a program which contains a function named "list_concate". The function receives two list and concatenate them element-wise into a new list, and then return the list. Print the final list.

For example:

list1 = ["py", "i", "m", "favou", "lang"]

list2 = ["thon", "s", "y", "rite", "uage"]

Expected output:

```
["python", "is", "my", "favourite", "language"]
```

Problem - 2

From a given NumPy array create another array which contains the odd rows and even colum. Finally print the new array.

For example, for the following given array:

arr = numpy.array([[20 ,66, 88, 12], [75 ,19, 92, 71], [27 ,90, 33, 67], [21 ,14, 25, 38], [51 ,44, 57, 77]])

Expected output array:

```
[[66 12]
 [90 67]
 [44 77]]
```

Problem - 3

Create an 8x3 NumPy integer array from a range between 10 to 34 (using numpy.arange() function) such that the difference between each element is 1 and then Split the array into 4 (four) equal-sized sub-arrays.

Problem - 4

Create a 3x3 NumPy integer array, and then do the following:

- (a) sort the array by the second row, and
- (b) sort the array by the second column.

For example,

Printing the Original array: [[34 43 73] [82 22 12] [53 94 66]]

Sorting the Original array by second row: [[73 43 34] [12 22 82] [66 94 53]]

Sorting the Original array by second column: [[82 22 12] [34 43 73] [53 94 66]]

Problem - 5

Create a parent class named `Vehicle` which contains three attributes (`name` , `mileage` , `capacity`), and a method called `fare` . `fare` method calculate the fare multiplying `capacity` by 100.

Now, create a subclass called `Bus` which inherits `Vehicle` class. In case of a `Bus` , the fare charge is extra 10% with the default price because of the maintenace cost (hint: you need to override the `fare` method).

Finally, create another class named `Minibus` which inherits `Bus` class. However, minibus has the fare carge half of the bus.

Now, create object for all the classes and print the fare charges for each of the object.

Problem - 6

Create a dictionary which contains all the reserved keywords and their meanings in Python programming languag. Also, create a function to check wheter a given word (taken from user) is reserved keyword or not.

Problem - 7

Write a program to create a Pascal Triangle pattern. The number of rows of the pattern will be taken from the user. Finally print the pattern.

Hints: A pascal triangle start with “1” at the top, then continue placing numbers below it in a triangular pattern, where each number is the numbers directly above it added together.

A sample pattern of Pascal Triange, which contains 7 rows:

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

1 6 15 20 15 6 1