

Assignment 1

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Objective

This assignment is based on unit 1, unit 2 and unit 3 study material and has problems that will inspire you to apply the concepts learned during first three days, of list operations, list comprehension, bitwise operator and string manipulation.

Problems

1. Given a list like `myList=[1,2,3,4]`, your task is to find sum of each number with another number, i.e., $1+2, 1+3, 1+4, 2+3, 2+4, 3+4$. Write two codes, one using list comprehension and other using `for` loop.
2. Given a list write a code to detect if there is a duplicate element present in the list (of integers) or not. Print yes or no. Write two codes, one using `==` operator and other using exclusive or operator `^`.
3. Given below is a 2D matrix, create a list of all the odd numbers present in the matrix. Also sort the list in descending order.

```
myMatrix = [[1, 2, 3, 4],
            [5, 6, 7],
            [8, 9, 10]]
```

4. Given below is a 2D matrix, create a list of squares of all the even numbers present in the matrix.

```
myMatrix = [[1, 2, 'aa', 3, 4],
            ['dd', 5, 6, 7],
            [8, 9, 10, 'cc']]
```

5. Given below is a 2D matrix, create a list of squares of all the prime numbers present in the matrix. (Hint: use $6k+1$ or $6k-1$ formula)

```
myMatrix = [[21, 22, 23, 4, 16, 17, 18, 19],
            [5, 6, 7, 14, 15, 20, 1, 2, 3],
            [8, 9, 10, 11, 12, 13]]
```

6. Make a dictionary of all those words, from the given paragraph, which are having 4 or more characters in it. Key of the dictionary should be word and value should be the number of times that word has appeared in the paragraph. eg. `{"feminist":3,"part":2,"campaign":1}`

```
mySentence="It's the Spice Girls but not as you know them. Twenty years after it was first released, this famous girl power anthem has been given a 21st century feminist makeover. The new video is part of Project Everyone's campaign to improve the lives of women and girls everywhere, calling for an end to violence against girls, quality education for all and equal pay for equal work."
```

7. Given a list, multiply all the elements of the list by 2 without using any arithmetic operator. **Hint:** use bitwise operator
8. Given below are two 2D matrix, add them element wise to form a third 2D matrix and print the resultant matrix.

```
myMatrix1 = [[1, 2, 3, 4],  
             [5, 6, 7, 6],  
             [8, 9, 10, 4]]  
  
myMatrix2 = [[3, 1, 1, 4],  
             [7, 7, 7, 7],  
             [8, 9, 10, 11]]
```