Assignment 6

Q. no.- 1 Tuple is like list, except that it is immutable.

```
>>> a = (1, 2)
>>> a[0]=1
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: 'tuple' object does not support item assignment
```

Question:
[MCQ] Which of the following declarations is a tuple with 1 element?
1) t = (1,)
2) t = (1)
3)t = [1]
4)t = ((1))
5) None of the above

Ans - 1

Q. no.- 2 Tuple is like list, except that it is immutable. However, the elements in a tuple can be mutable.

```
>>> a = ([1,1] 3)
>>> a[0][1] = 2
>>> a
([1,2], 3)
```

Question:
[MCQ] Which of the following operation on a tuple 't' is valid?
t=((1,2), [3,4])
1) t2 = (1,2)
t.extend(t2)
2) t.remove([3,4])
3) t+=([5,6],)
4) t[0][1]=3
5) None of the abov

Ans - 3

Q. no.- 3 The determinant of a 2x2 matrix is the product of the elements on the main diagonal minus the product of the elements off the main diagonal.

Examples

```
   >>> M = ((3,1), (5,2))
    >>> det(M)
```

```
1
```

Ans - def det(M):
    return ((M[0][0]*M[1][1])-(M[0][1]*M[1][0]))

Q. no.- 4 Write a function hasSameContent(t1, t2) that takes in two tuples as arguments and return True if both tuples contain the same items.

Examples

```
>>> hasSameContent((1, 2), (1, 2))
True
>>> hasSameContent((1, 2), (2, 1))
True
>>> hasSameContent((1, 2), (1, 2, 1))
False
>>> hasSameContent((1, 2), ())
False
```

Ans - def hasSameContent(t1, t2):
    if len(t1)==len(t2):
        for x in t1:
            if t1[x] in t2:
                return True
            else:
                return False
    return False

Q. no.- 5 Write a function sumNumbers(*args) that takes in a variable-length argument list of numbers and returns the sum of the numbers.

Examples

```
>>> sumNumbers(1,2,3,4,5)
15
>>> sumNumbers(1,2,3)
6
>>> sumNumbers(1)
1
```

Ans - def sumNumbers(*args):
    sum=0
    for x in args:
        sum=sum+x
    return sum

Q. no.- 6 Write a function commonElements(t1, t2) that takes in 2 tuples as arguments and returns a sorted tuple containing elements that are found in both tuples.

Examples

```
>>> commonElements((1, 2, 3), (2, 5, 1))
(1, 2)
>>> commonElements((1, 2, 3, 'p', 'n'), (2, 5 ,1, 'p'))
(1, 2, 'p')
>>> commonElements((1, 3, 'p', 'n'), ('a', 2 , 5, 1, 'p'))
(1, 'p')
```

Ans - def commonElements(t1,t2):

```
    temp = []
    st2  = set(t2)
    for ele in t1:
        if ele in st2:
            temp.append(ele)
    return tuple(sorted(temp))
```

Q. no.- 7 Write a function removeCommonElements(t1, t2) that takes in 2 tuples as arguments and returns a sorted tuple containing elements that are **not** found in both tuples.

Examples

```
>>> removeCommonElements((1,2,3,4), (3,4,5,6))
(1, 2, 5, 6)
>>> removeCommonElements(('b','a','c','d'), ('a','b','c'))
('d',)
>>> removeCommonElements(('a','b','c'), ('a','b','c'))
()
>>> removeCommonElements(('a','b'), ('c', 'd'))
('a', 'b', 'c', 'd')
>>> removeCommonElements(('b','a','d','c'), ('a','b'))
('c', 'd')
```

Ans - def removeCommonElements(t1,t2):

```
    temp=[]
    str=set(t2)
    for x in t1:
        if x not in t2:
            temp.append(x)
    for y in t2:
        if y not in t1:
```

```
            temp.append(y)
    return tuple(sorted(temp))
```

Q. no.- 8 Write a function shiftByTwo(*args) that takes in variable-length argument and returns a tuple with its elements shifted to the right by two indices. See samples given below.

Examples

```
>>> shiftByTwo(1,2,3,4,5,6)
(5, 6, 1, 2, 3, 4)
>>> shiftByTwo('a','b','c','d')
('c', 'd', 'a', 'b')
>>> shiftByTwo('a','b')
('a', 'b')
>>> shiftByTwo('b')
('b',)
```

Ans -
```
def shiftByTwo(*args):
    length=len(args)
    if length !=0:
        length=length-2
    else:
        return tuple()
    return args[length:]+args[0:length]
```

Q. no.- 9 Write a function sortByIndex(aList) that takes in a list of tuple in the following format: (index, value) and returns a new tuple with its elements sorted based on the index.

Examples

```
>>> sortByIndex([(4,'Python'), (1, 'Welcome'), (3, 'Begin'), (2, 'To')])
('Welcome', 'To', 'Begin', 'Python')
>>> sortByIndex([(2,'Programming'), (3, 'is'), (1, 'Python'), (4, 'Fun')])
('Python', 'Programming', 'is', 'Fun')
>>> sortByIndex([(2,'is'), (3, 'Immutable'), (1, 'Tuple')])
('Tuple', 'is', 'Immutable')
```

Ans -
```
def sortByIndex(aList):
    aList.sort()
    lst=[]
    for x in aList:
        lst.append(x[1])
    return tuple(lst)
```

Q. no.- 10 Write a function sortByLength(t, order) that takes in a tuple of string and returns a new tuple with its elements sorted by the length of the string. The order of sorting is based on the value of the second argument: 'asc' or 'des'.

Examples

```
>>> sortByLength(('iOS', 'iPhone', 'iPad'), 'asc')
('iOS', 'iPad', 'iPhone')
>>> sortByLength(('apple', 'orange', 'pear'), 'des')
('orange', 'apple', 'pear')
>>> sortByLength(('begin', 'python', 'programming'), 'des')
('programming', 'python', 'begin')
>>> sortByLength(('begin', 'python', 'programming'), 'asc')
('begin', 'python', 'programming')
```

Ans -
```
def sortByLength(t,order):
    lst=[]
    if order=='asc':
        lst = sorted(t, key=len)
        return tuple(lst)
    else:
        lst =sorted(t, key=len, reverse=True)
        return tuple(lst)
```