Solution,11feb,2022

1.Write a Python program to calculate an age in year.

Solution:

```
>>> from datetime import date
>>>
>>> def calculate_age(dtob):
>>>     today = date.today()
>>>     return today.year - dtob.year - ((today.month, today.day) < (dtob.month, dtob.day))
>>> print()
>>>print(calculate_age(date(2006,10,12)))
>>> print(calculate_age(date(1989,1,12)))
>>> print()
```

2 . Write a Python class named Rectangle constructed by a length and width and a method which will compute the area of a rectangle.

Solution:

```
>>> class Rectangle():
>>>     def __init__(self, l, w):
>>>         self.length = l
>>>         self.width  = w
>>>
>>>    def rectangle_area(self):
>>>         return self.length*self.width

>>> newRectangle = Rectangle(12, 10)
>>> print(newRectangle.rectangle_area())
```

3. Write a Python program to find a valid substring of a given string that contains matching brackets, at least one of which is nested.

Solution:

```
>>> def test(s):
>>>     import re
```

```
>>>     return re.search(r"\[(\[\])+\]", s).group(0)

>>> brackets = "]][][[]]"
>>> print("Original List of strings:",brackets)
>>> print("\nFind a valid substring of the said string that contains matching brackets, at least
one of which is nested:")
>>> print(test(brackets))
>>> brackets = "]]]]]]]]]]]]]]]]][][][][]]]]]]]]]][[[][][[[[[][][][][[[[[[[[[[[[[[[[[[["
>>>print("\nOriginal List of strings:",brackets)
>>> print("\nFind a valid substring of the said string that contains matching brackets, at least
one of which is nested:")
>>> print(test(brackets))
```

4.Write a Python program to find four positive even integers whose sum is a given integer

```
>>> def test(n):
>>>     for a in range(n, 0, -1):
>>>         if not a % 2 == 0:
>>>             continue
>>>         for b in range(n - a, 0, -1):
>>>             if not b % 2 == 0:
>>>                 continue
>>>             for c in range(n - b - a, 0, -1):
>>>                 if not c % 2 == 0:
>>>                     continue
>>>                 for d in range(n - b - c - a, 0, >>> -1):
>>>                     if not d % 2 == 0:
>>>                         continue
>>>                     if a + b + c + d == n:
>>>                         return [a, b, c, d]
>>>
>>> n = 100
>>> print("Four positive even integers whose sum is",n)
>>> print(test(n))
>>> n = 1000
>>> print("\nFour positive even integers whose sum is",n)
>>> print(test(n))
>>> n = 10000
>>> print("\nFour positive even integers whose sum is",n)
>>> print(test(n))
>>> n = 1234567890
>>> print("\nFour positive even integers whose sum is",n)
>>> print(test(n))
```

5.. Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters. Go to the editor
Sample String : 'The quick Brow Fox')

Solution:

```
>>> def string_test(s):
>>>     d={"UPPER_CASE":0, "LOWER_CASE":0}
>>>     for c in s:
>>>         if c.isupper():
>>>             d["UPPER_CASE"]+=1
>>>         elif c.islower():
>>>             d["LOWER_CASE"]+=1
>>>         else:
>>>             pass
>>>     print ("Original String : ", s)
>>>     print ("No. of Upper case characters : ", d["UPPER_CASE"])
>>>     print ("No. of Lower case Characters : ", d["LOWER_CASE"])

>>> string_test('The quick Brown Fox')
```

6.Write a Python function to check whether a number falls in a given range.

Solution:

```
>>> def test_range(n):
>>>     if n in range(3,9):
>>>         print( " %s is in the range"%str(n))
>>>     else :
>>>        print("The number is outside the given range.")
>>> test_range(5)
```

7.Write a Python program to find the first repeated character in a given string.

Solution:

```
>>> def first_repeated_char(str1):
>>> for index,c in enumerate(str1):
>>>     if str1[:index+1].count(c) > 1:
```

```
>>>      return c
>>>  return "None"

>>>print(first_repeated_char("abcdabcd"))
>>> print(first_repeated_char("abcd"))
```

8.Write a Python program which reads an integer n and find the number of combinations of a,b,c and d (0 ≤ a,b,c,d ≤ 9) where (a + b + c + d) will be equal to n.

Solution:

```
>>> import itertools
>>> print("Input the number(n):")
>>> n=int(input())
>>> result=0
>>>for (i,j,k) in itertools . product ( range (10),range(10),range(10)):
>>>     result+=(0<=n-(i+j+k)<=9)
>>> print("Number of combinations:",result)
```

9.Write a Python program to find the coordinates of a triangle with the given side lengths.

Solution:

```
>>> def test(sides):
>>>    a, b, c = sorted(sides)
>>>    s = sum(sides) / 2 # semi-perimeter
>>>    area = (s * (s - a) * (s - b) * (s - c)) ** >>> 0.5
>>>
>>>  # Heron's formula
>>>    y = 2 * area / a # height
>>>    x = (c ** 2 - y ** 2) ** 0.5
>>>   return [[0.0, 0.0], [a, 0.0], [x, y]]
>>> sides = [3, 4, 5]
>>> print("Sides of the triangle:",sides)
>>> print("Coordinates of a triangle with the said side lengths:")
>>> print(test(sides))
>>> sides = [5, 6, 7]
>>> print("\nSides of the triangle:",sides)
>>> print("Coordinates of a triangle with the said side lengths:")
>>> print(test(sides))
```

10. Write a Python program to find the positions of all uppercase vowels (not counting Y) in even indices of a given string.

```
>>> def test(strs):
>>>     return [i for i, c in enumerate(strs) if i % 2 == 0 and c in "AEIOU"]
>>> strs = "w3rEsOUrcE "
>>> print("Original List:",strs)
>>> print("Positions of all uppercase vowels (not counting Y) in even indices:")
>>> print(test(strs))
>>> strs = "AEIOUYW "
>>> print("\nOriginal List:",strs)
>>> print("Positions of all uppercase vowels (not counting Y) in even indices:")
>>>print(test(strs))
```