



**SAVEETHA SCHOOL OF ENGINEERING**  
**SAVEETHA INSTITUTE OF MEDICAL AND SCIENCES**  
**CHENNAI-602105**  
**INSTITUTE OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**  
**DEPRATMENT OF DATA SCIENCE**



**Course code/Name: CSA08/ Python Programming**

1. Write a python program using function to calculate the simple interest. Suppose the customer is a senior citizen. He is being offered 12 percentage rate of interest; for all other customers, the ROI is 10 percentage.

Sample Input:

Enter the principal amount: 200000

Enter the no of years: 3

Is customer senior citizen (y/n): n

Sample Output:

Interest: 60000

Test Cases:

1. Principal: 2000 , Years: 0
2. Principal: 20000 , Years: -2
3. Principal: -2000 , Years: 2
4. Principal: 2 , Years: 2000
5. Principal: 0 , Years: 5

2. Write a Python function sumsquare(l) that takes a nonempty list of integers and returns a list [odd,even], where odd is the sum of squares of all the odd numbers in l and even is the sum of squares of all the even numbers in l.

Sample Input:

Enter the number of elements:7

Enter the element: 18

Enter the element:9

Enter the element:1

Enter the element:12

Enter the element:13

Enter the element:4

Enter the element:30

Output:

[251,1384]

**Test Cases:**

1. 5, [1,2,3,4,5]
2. 8, [2,4,5,6,7,11,12,13]
3. -1, [12,10,11,1,2]
4. 0, [1,2,3,4,5]
5. -8, [2,4,5,6,7,11,12,13]

3. Maximum Number of Words Found in Sentences

A sentence is a list of words that are separated by a single space with no leading or trailing spaces. You are given a list of strings sentences, where each sentences[i] represents a single sentence. Write a python program to return the maximum number of words that appear in a single sentence

**Test Cases:**

1. Input: sentences = ["alice and bob love apple", "i think so too", "this is great thanks very much"]  
Output: 6
2. Input: sentences = ["please wait", "continue to fight", "continue to win"]  
Output: 3
3. ["the heads", "of", "two", "sorted linked lists"]
4. ["python", "is", "an object-oriented programming language"]
5. ["python", "is", "an interactive language"]

4. Given an integer x as numeric data type. Write a python program to return true if x is palindrome integer.

An integer is a **palindrome** when it reads the same backward as forward.

For example, 121 is a palindrome while 123 is not.

#### Test cases:

1. Input: x = 121

Output: true

Explanation: 121 reads as 121 from left to right and from right to left.

2. Input: x = -121

Output: false

Explanation: From left to right, it reads -121. From right to left, it becomes 121-. Therefore it is not a palindrome.

3. Input: x = 10

Output: false

Explanation: Reads 01 from right to left. Therefore it is not a palindrome.

4. x=abc

5. x=0

5. Write a python program to print the numbers from M to N by skipping K numbers in between? Get the input using list data type.

Sample Input:

M = 50

N = 100

K = 7

Sample Output:

50, 58, 66, 74, .....

Test cases:

1. M = 15, N = 05, K = 02

2. M = 25, N = 50, K = 04

3. M = 15, N = 100, K = -02

4. M = 0, N = 0, K = 2

5. M = 200, N = 200, K = 50

6. Most years have 365 days. However, the time required for the Earth to orbit the Sun is actually slightly more than that. As a result, an extra day, February 29, is included in some years to correct for this difference. Such years are referred to as leap years.

The rules for determining whether or not a year is a leap year follow:

Any year that is divisible by 400 is a leap year.

Of the remaining years, any year that is divisible by 100 is not a leap year.

Of the remaining years, any year that is divisible by 4 is a leap year.

All other years are not leap years.

Write a python program that reads a year from the user and displays a message indicating whether or not it is a leap year.

Sample Input:

Enter Date : 1947

Sample Output:

Given year is Non Leap Year

Leap Year: 1944

**Test cases:**

1. 1947
2. 1936
3. 0
4. 2000
5. -1428

7. Write a python program to print the following pattern.

Sample Input:

Number of rows:5

Sample output:

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
```

Test cases:

- 1) 0
- 2) -1
- 3) 4.5
- 4) 6
- 5) 5

8. Merge Two Sorted Lists

You are given the heads of two sorted lists list1 and list2.

Constraints:

- The number of items in both lists is in the range [0, 50].
- Both list1 and list2 are sorted in non-decreasing order.

**Test cases:**

1.Input: list1 = [1,2,4], list2 = [1,3,4]

Output: [1,1,2,3,4,4]

2.Input: list1 = [], list2 = []

Output: []

3.Input: list1 = [], list2 = [0]

Output: [0]

4.list1=[],list2=[1,2,3,4,5]

5.list1=[0,1,9], list2=[3,4,5]

9. Write a python program for matrix addition using nested list?

Sample Input:

Mat1 = 1 2

5 3

Mat2 = 2 3

4 1

Sample Output:

Mat Sum = 3 5

9 4

Test Cases:

1. Mat1=[7,-1,5,4], Mat2=[2, 5 , 4, 3]
2. Mat1=[4,8,3,7], Mat2=[1,0,5,2]
3. Mat1=[4,8,3,7], Mat2=[1,0,5,2, 5, 6]
4. Mat1=[3,-4,8,5], Mat2=[9,-5,6,-6]
5. Mat1=[0,0],Mat2=[0,0,0,0]

10. The Project manager has to submit the project within a week period. He didn't find the proper combinations of team members to work on the project, Help him in finding the possible combinations available.

Write a python program to Accept 3 digits and find all the combinations

**Sample Input:**

123

**Sample Output:**

123

132

213

231

312

321

**Test Cases:**

1. 789
2. 1456
3. -856
4. 1001
5. 555