1. Write a function **generate()** which will accept an integer as argument ,generates a random number with exactly 'n' digits and returns it. Accept a number 'n' from the user and pass it to the generate function . If 'n' is not passed to the function during the call then the function should return a 3 digit number generated randomly.

2. Calculate the sum of the following series for n terms. Accept x and n from the user and pass it to the function sum.

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

Create functions for the following:

- ➔ **power** which will calculate the power of x and returns it(**not to use math.pow()**)
- ➔ **factorial** which will calculate the factorial of the given number and returns it
- ➔ **Sum** which will call the functions power and factorial , calculates the sum of the given series and returns it.

3.

Write a function listreplace (ARR,n)in Python, which accepts a list ARR of numbers , the function will replace the odd number by value 100 and multiply even number by 10 .

Sample Input Data of the list is: a=[10,20,23,45]

listreplace(a,4)

output : [100, 200, 123, 145]

4.

Write a function listshift(list,n)in Python, which accepts a list of numbers and length of list , the function will replace the first half of the list with second

List=[11,22,33,44,55,66]

Output:

[44,55,66,11,22,33]

5.

Write a function findinlist(list,n)in Python, which accepts a list of numbers and length of list , the function will **return** the minimum value from the first half and maximum value from the second half.

List=[1,2,3,4,5,6,7,8,9,0]

Output:

Minimum number in [1,2,3,4,5] is 1

Maximum number in [6,7,8,9,0] is 9

6. A **palindrome** is a sequence of characters which reads the same backward as forward, such as madam or racecar.
Write a function check(string) which accept a string and check if it is a palindrome or not . Display appropriate messages.

7. Declare a dictionary named **department** globally .with the following keys : deptno ,dname and loc
Write the following following functions to

Add() : To add records in the dictionary deoartment

Delete(): Accept deptno from user and delete the records

Upadte() Accept deptno and update the records(dname or location)

Display() display all records

Exit() End the application

Call the functions using proper menu.