1. Write a Python program to check if the given number is a Disarium Number?

**Ans:** def calculateLength(n):  
 length = 0  
 while (n != 0):  
 length = length + 1  
 n = n // 10  
 return length  
num = 89  
rem = sum = 0  
len = calculateLength(num)  
# Makes a copy of the original number num  
n = num  
# Calculates the sum of digits powered with their respective position  
while (num > 0):  
 rem = num % 10  
 sum = sum + int(rem \*\* len)  
 num = num // 10  
 len = len - 1  
# Checks whether the sum is equal to the number itself  
if (sum == n):  
 print(str(n) + " is a disarium number")  
else:  
 print(str(n) + " is not a disarium number")

1. Write a Python program to print all disarium numbers between 1 to 100?

**Ans:** def calculateLength(n):  
 length = 0  
 while (n != 0):  
 length = length + 1  
 n = n // 10  
 return length  
# sumOfDigits() will calculates the sum of digits powered with their respective position  
def sumOfDigits(num):  
 rem = sum = 0  
 len = calculateLength(num)  
 while (num > 0):  
 rem = num % 10  
 sum = sum + (rem \*\* len)  
 num = num // 10  
 len = len - 1  
 return sum  
result = 0  
# Displays all disarium numbers between 1 and 100  
print("Disarium numbers between 1 and 100 are")  
for i in range(1, 101):  
 result = sumOfDigits(i)  
 if (result == i):  
 print(i)

1. Write a Python program to check if the given number is Happy Number?

**Ans:** def isHappyNumber(num):  
 rem = sum = 0  
 # Calculates the sum of squares of digits  
 while (num > 0):  
 rem = num % 10  
 sum = sum + (rem \* rem)  
 num = num // 10  
 return sum  
num = 82  
result = num  
while (result != 1 and result != 4):  
 result = isHappyNumber(result)  
# Happy number always ends with 1  
if (result == 1):  
 print(str(num) + " is a happy number")  
# Unhappy number ends in a cycle of repeating numbers which contain 4  
elif (result == 4):  
 print(str(num) + " is not a happy number")

1. Write a Python program to print all happy numbers between 1 and 100?

**Ans:** def isHappyNumber(num):  
 rem = sum = 0  
 # Calculates the sum of squares of digits  
 while (num > 0):  
 rem = num % 10  
 sum = sum + (rem \* rem)  
 num = num // 10  
 return sum  
# Displays all happy numbers between 1 and 100  
print("List of happy numbers between 1 and 100: ")  
for i in range(1, 101):  
 result = i  
 # Happy number always ends with 1 and  
 # unhappy number ends in a cycle of repeating numbers which contains 4  
 while (result != 1 and result != 4):  
 result = isHappyNumber(result)  
 if (result == 1):  
 print(i),  
 print(" ")

1. Write a Python program to determine whether the given number is a Harshad Number?

**Ans:** num = 120  
rem = sum = 0  
# Make a copy of num and store it in variable n  
n = num  
# Calculates sum of digits  
while (num > 0):  
 rem = num % 10  
 sum = sum + rem  
 num = num // 10  
# Checks whether the number is divisible by the sum of digits  
if (n % sum == 0):  
 print(str(n) + " is a harshad number")  
else:  
 print(str(n) + " is not a harshad number")

1. Write a Python program to print all pronic numbers between 1 and 100?

**Ans:** def isPronicNumber(num):  
 flag = False  
 for j in range(1, num + 1):  
 # Checks for pronic number by multiplying consecutive numbers  
 if ((j \* (j + 1)) == num):  
 flag = True  
 break  
 return flag  
# Displays pronic numbers between 1 and 100  
print("Pronic numbers between 1 and 100: ")  
for i in range(1, 101):  
 if (isPronicNumber(i)):  
 print(i),  
 print(" ")