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

**def** checkDisariumNumber():

in\_num **=** input('Enter a Number: ')

sum **=** 0

**for** item **in** range(len(in\_num)):

sum **=** sum **+** int(in\_num[item])**\*\***(item**+**1)

**if** sum **==** int(in\_num):

print(f'{in\_num} is a Disarium Number')

**else**:

print(f'{in\_num} is a Not Disarium Number')

checkDisariumNumber()

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

**def** printDisariumNumbers(start**=**0,end**=**100):

output\_num **=** []

**for** number **in** range(start,end**+**1):

sum **=** 0

**for** item **in** range(len(str(number))):

sum **=** sum **+** int(str(number)[item])**\*\***(item**+**1)

**if** sum **==** number:

output\_num**.**append(number)

**return** output\_num

printDisariumNumbers(1,1000)

**Output:**

[1, 2, 3, 4, 5, 6, 7, 8, 9, 89, 135, 175, 518, 598]

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

**def** checkHappyNumber():

in\_num **=** input('Enter a Number: ')

in\_num\_duplicate **=** in\_num

trackNumber **=** set()

**while** **True**:

**if** in\_num **!=** '1' **and** str(in\_num) **not** **in** trackNumber:

trackNumber**.**add(in\_num)

sum **=** 0

**for** ele **in** range(len((in\_num))):

sum **=** sum **+** int(in\_num[ele])**\*\***2

in\_num **=** str(sum)

**elif** str(in\_num) **in** trackNumber:

print(f'{in\_num\_duplicate} is not a Happy Number')

**break**

**else**:

print(f'{in\_num\_duplicate} is a Happy Number')

**break**

checkHappyNumber()

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

**def** checkHappyNumber(start**=**0,end**=**100):

happyNumbersList **=** []

**for** in\_num **in** range(start,end**+**1):

in\_num **=** str(in\_num)

inum\_holder **=** in\_num

trackNumber **=** set()

**while** **True**:

**if** in\_num **!=** '1' **and** str(in\_num) **not** **in** trackNumber:

trackNumber**.**add(in\_num)

sum **=** 0

**for** ele **in** range(len((in\_num))):

sum **=** sum **+** int(in\_num[ele])**\*\***2

in\_num **=** str(sum)

**elif** str(in\_num) **in** trackNumber:

**break**

**else**:

happyNumbersList**.**append(int(inum\_holder))

**break**

print(f'The Happy Numbers between {start} and {end} are {happyNumbersList}')

checkHappyNumber(0,100)

**Output:**

The Happy Numbers between 0 and 100 are [1, 7, 10, 13, 19, 23, 28, 31, 32, 44, 49, 68, 70, 79, 82, 86, 91, 94, 97, 100]

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

**def** digsum(num):

sum **=** 0

**while**(num**>**0):

dig **=** num**%**10

sum**=** sum **+** dig

num **=** num**//**10

**return** sum

num **=** int(input("Enter no. :"))

sum **=** digsum(num)

**if** num **%** sum **==** 0:

print(num,"Is a Harshad number")

**else**:

print(num,"Is not a Harshad number")

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

**def** PronicNo(num):

Pronic **=** **False**

**for** i **in** range(1,num**+**1):

**if** i**\***(i**+**1) **==** num:

Pronic **=** **True**

**break**

**return** Pronic

print("Pronic numbers in range 1 to 100")

pronicno **=** []

**for** i **in** range(1,101):

**if** PronicNo(i):

pronicno**.**append(i)

print(pronicno)

**Output:**

Pronic numbers in range 1 to 100:

[2, 6, 12, 20, 30, 42, 56, 72, 90]