1. Write a Python program to check if the given number is a Disarium Number?
2. Write a Python program to print all disarium numbers between 1 to 100?
3. Write a Python program to check if the given number is Happy Number?
4. Write a Python program to print all happy numbers between 1 and 100?
5. Write a Python program to determine whether the given number is a Harshad Number?
6. Write a Python program to print all pronic numbers between 1 and 100?

Solution-:

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

In [1]:

**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()

checkDisariumNumber()

Enter a Number: 135

135 is a Disarium Number

Enter a Number: 100

100 is a Not Disarium Number

**2.Write a Python Program to print all Disarium numbers between 1 to 100 ?**

In [2]:

**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)

Out[2]:

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

**3.Write a Python Program to check if the given number is Happy Number ?**

In [3]:

**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()

checkHappyNumber()

Enter a Number: 7

7 is a Happy Number

Enter a Number: 10

10 is a Happy Number

**4.Write a Python Program to print all Happy numbers between 1 and 100 ?**

In [4]:

**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)

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]

**5.Write a Python Program to determine whether the given number is a Harshad Number ?**

In [5]:

**def** checkHarshadNumber():

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

sum **=** 0

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

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

**if** int(in\_num)**%sum** == 0:

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

**else**:

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

checkHarshadNumber()

checkHarshadNumber()

Enter a Number: 6804

6804 is a Harshad Number

Enter a Number: 20

20 is a Harshad Number

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

In [6]:

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

outputList **=** []

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

outputList**.**append((ele)**\***(ele**+**1))

print(outputList)

printPronicNumbers()

[0, 2, 6, 12, 20, 30, 42, 56, 72, 90, 110, 132, 156, 182, 210, 240, 272, 306, 342, 380, 420, 462, 506, 552, 600, 650, 702, 756, 812, 870, 930, 992, 1056, 1122, 1190, 1260, 1332, 1406, 1482, 1560, 1640, 1722, 1806, 1892, 1980, 2070, 2162, 2256, 2352, 2450, 2550, 2652, 2756, 2862, 2970, 3080, 3192, 3306, 3422, 3540, 3660, 3782, 3906, 4032, 4160, 4290, 4422, 4556, 4692, 4830, 4970, 5112, 5256, 5402, 5550, 5700, 5852, 6006, 6162, 6320, 6480, 6642, 6806, 6972, 7140, 7310, 7482, 7656, 7832, 8010, 8190, 8372, 8556, 8742, 8930, 9120, 9312, 9506, 9702, 9900, 10100]