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

Ans:

```
17]:
def calculateLength(n):
    length = 0
    while(n != 0):
        length = length + 1
        n = n//10
    return length

num =  int(input("Enter a number: "))
rem = sum = 0
len = calculateLength(num)
n = num

while(num > 0):
    rem = num%10
    sum = sum + int(rem**len)
    num = num//10
    len = len - 1


if(sum == n):
    print(str(n) + " is a disarium number")
else:
    print(str(n) + " is not a disarium number")
```

```
Enter a number: 157
157 is not a disarium number
```

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

Ans:

```
[7]:
def calculateLength(n):
    length = 0
    while(n != 0):
        length = length + 1;
        n = n//10
    return length

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
lower_range = int(input("Enter lower range: "))
upper_range = int(input("Enter upper range: "))
print("Disarium numbers between {0} and {1} are : ".format(lower_range,upper_range))
for i in range(lower_range,upper_range):
    result = sumOfDigits(i)
    if(result == i):
        print(i)
```

```
Enter lower range: 1
Enter upper range: 100
Disarium numbers between 1 and 100 are :
1
2
3
4
5
6
7
8
9
89
```

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

Ans:

```
def happy_number(num):
    rem = sum = 0
    while(num > 0):
        rem = num%10;
        sum = sum + (rem*rem);
        num = num//10
    return sum

num = int(input("Enter a number: "))
result = num

while(result != 1 and result != 4):
    result = happy_number(result)

if(result == 1):
    print(str(num) + " is a happy number")
elif(result == 4):
    print(str(num) + " is not a happy number")
```

```
Enter a number: 22
22 is not a happy number
```

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

Ans:

```
def happy_number_interval(num):
    rem = sum = 0
    while(num > 0):
        rem = num%10
        sum = sum + (rem*rem)
        num = num//10
    return sum

lower_range = int(input("Enter lower range: "))
upper_range = int(input("Enter upper range: "))
print("List of happy numbers between {0} and {1} are : ".format(lower_range,upper_range))
for i in range(lower_range,upper_range+1):
    result = i

    while(result != 1 and result != 4):
        result = happy_number_interval(result)
    if(result == 1):
        print(i)
```

```
Enter lower range: 1
Enter upper range: 100
List of happy numbers between 1 and 100 are :
1
7
10
13
19
23
28
31
32
44
49
68
70
79
82
86
91
94
97
```

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

Ans:

```
num = int(input("Enter a number: "))
rem = sum = 0
n = num;
while(num > 0):
    rem = num%10
    sum = sum + rem
    num = num//10

if(n%sum == 0):
    print(str(n) + " is a harshad number")
else:
    print(str(n) + " is not a harshad number")
```

```
Enter a number: 156
156 is a harshad number
```

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

Ans:

```
]:
def pronic_number(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
lower_range = int(input("Enter lower range: "))
upper_range = int(input("Enter upper range: "))
print("Pronic numbers between {0} and {1}: ".format(lower_range,upper_range))
for i in range(lower_range,upper_range+1):
    if(pronic_number(i)):
        print(i)
```

```
Enter lower range: 1
Enter upper range: 100
Pronic numbers between 1 and 100:
2
6
12
20
30
42
56
72
90
```