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

```
#calculateLength() will count the digits present in a number
def calculateLength(n):
   length = 0;
   while(n != 0):
      length = length + 1;
      n = n//10;
   return length;

num = 175;
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");
```

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

```
#calculateLength() will count the digits present in a number
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)
```

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

```
def is_Happy_num(n):
  past = set()
  while n != 1:
      n = sum(int(i)**2 for i in str(n))
      if n in past:
          return False
      past.add(n)
  return True
print(is_Happy_num(7))
print(is_Happy_num(932))
print(is_Happy_num(6))
```

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

```
#isHappyNumber() will determine whether a number is happy or not
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(" "),
```

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

```
num = 156;
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")
```

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

```
#isPronicNumber() will determine whether a given number is a pronic number or not
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(" ")
```