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

Soln;

```
def is_disarium_number(num):
    # Converting the number to a string and get its length
    num_str = str(num)
    n = len(num_str)

    # Calculating the sum of the digits powered to their respective positions
    sum = 0
    for i in range(n):
        digit = int(num_str[i])
        sum += digit**(i+1)

    # Checking if the sum is equal to the original number
    return sum == num
```

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

Soln:

```
def is_disarium_number(num):
    # Converting the number to a string and get its length
    num_str = str(num)
    n = len(num_str)

    # Calculating the sum of the digits powered to their respective positions
    sum = 0
    for i in range(n):
        digit = int(num_str[i])
        sum += digit**(i+1)

    # Checking if the sum is equal to the original number
    return sum == num

# Printing all Disarium numbers between 1 and 100
for i in range(1, 101):
    if is_disarium_number(i):
        print(i)
```

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

Soln:

```
def is_happy_number(num):
    # Initializing a set to keep track of seen numbers
    seen = set()

    # Repeating the process until we find 1 or a cycle
    while num != 1 and num not in seen:
        seen.add(num)
        sum = 0
        while num > 0:
            digit = num % 10
            sum += digit ** 2
            num //= 10
        num = sum

    # Return True if the number is happy, False otherwise
    return num == 1
```

---

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

Soln;

```
def is_happy_number(num):
    # Initialize a set to keep track of seen numbers
    seen = set()

    # Repeat the process until we find 1 or a cycle
    while num != 1 and num not in seen:
        seen.add(num)
        sum = 0
        while num > 0:
            digit = num % 10
            sum += digit ** 2
            num //= 10
        num = sum

    # Return True if the number is happy, False otherwise
    return num == 1
```

```
# Print all Happy numbers between 1 and 100
for i in range(1, 101):
    if is_happy_number(i):
        print(i)
```

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

Soln;

```
def is_harshad_number(num):
    # Sum of digits of the number
    sum_of_digits = sum(int(digit) for digit in str(num))

    # Checking if the number is divisible by the sum of its digits
    return num % sum_of_digits == 0
```