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

```python
def is_disarium(num):
    """Checks if the given number is a Disarium Number."""
    digits = list(map(int, str(num)))
    n = len(digits)
    sum = 0
    for i in range(n):
        sum += digits[i] ** (i+1)
    return sum == num

# Testing
print(is_disarium(175))  # True
print(is_disarium(89))   # False
print(is_disarium(135))  # True
```

```
True
True
True
```

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

```python
for num in range(1, 101):
    # Convert number to string to access individual digits
    num_str = str(num)
    # Get the number of digits
    n = len(num_str)
    # Calculate the sum of each digit raised to the power of its position
    disarium_sum = sum(int(num_str[i])** (i+1) for i in range(n))
    # Check if the sum is equal to the original number
    if disarium_sum == num:
        print(num)
```

```
1
2
3
4
5
6
7
8
9
89
```

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

```python
def is_happy_number(num):
    """
    This function takes a number as input and returns True if the number is a Happy Number, and False otherwise.
    """
    sum = 0
    while num > 0:
        digit = num % 10
        sum += digit**2
        num //= 10
    if sum == 1:
        return True
    elif sum == 4: # Since 4 is the only number that is not happy
        return False
    else:
        return is_happy_number(sum)

# Testing the function
num = int(input("Enter a number to check if it is a Happy Number: "))
if is_happy_number(num):
    print(num, "is a Happy Number!")
else:
    print(num, "is not a Happy Number!")
```

```
Enter a number to check if it is a Happy Number: 84
84 is not a Happy Number!
```

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

```python
def is_happy_number(num):
    '''Function to check if a number is a happy number or not'''
    sum = 0
    while num > 0:
        digit = num % 10
        sum += digit ** 2
        num //= 10
    if sum == 1:
        return True
    elif sum == 4:
        return False
    else:
        return is_happy_number(sum)

# Main program to print all happy numbers between 1 and 100
for num in range(1, 101):
    if is_happy_number(num):
        print(num)
```

```
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?

```python
number = int(input("Enter a number: "))
sum_of_digits = sum(int(digit) for digit in str(number))

if number % sum_of_digits == 0:
    print(number, "is a Harshad number")
else:
    print(number, "is not a Harshad number")
```

```
Enter a number: 79
79 is not a Harshad number
```

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

```python
for i in range(1, 101):
    for j in range(1, i):
        if j * (j+1) == i:
            print(i, end=" ")
            break
```

```
2 6 12 20 30 42 56 72 90
```