```python
"""Q1. Sum pf all GCD"""

def gcd(a, b):
    if b == 0:
        return a
    return gcd(b, a % b)

def sum_of_gcd(N):
    sum = 0
    for i in range(1, N + 1):
        for j in range(i + 1, N + 1):
            sum += gcd(i, j)
    return sum

N = 12
print("Sum of all GCDs : ", sum_of_gcd(N))
```

```
Sum of all GCDs :  105
>
```

```python
"""Q2.Print the given pattern"""

def print_pattern(input1, input2):
    result = ''
    for i in range(max(len(input1), len(input2))):
        if i < len(input1):
            result += input1[i]
        if i < len(input2):
            result += input2[i]
    return result

input1 = 'Samarthya'
input2 = 'Club'
print(print_pattern(input1, input2))
```

```
SCalmuabrthya
>
```

```python
"""Q4a. Remove all duplicate charecters"""

def remove_duplicates(input_string):
    char_set = set()
    result = ''
    for char in input_string:
        if char not in char_set:
            char_set.add(char)
            result += char
    return ''.join(sorted(result))

input_string = 'ssaamarrthyya'
print(remove_duplicates(input_string))
```

```
ahmrsty
>
```

```python
"""Q4b. Print diagonal elements"""

def print_diagonal(matrix):
    result = []
    for i in range(len(matrix)):
        result.append(matrix[i][i])
    return result

matrix = [[1,2,3],[4,5,6],[7,8,9]]
print(print_diagonal(matrix))
```

```
[1, 5, 9]
>
```

```python
"""Q5. Sum of elements of each row and column of a matrix"""

def center_column(matrix):
    result = []
    if len(matrix[0]) % 2 == 1:
        center = len(matrix[0]) // 2
        for row in matrix:
            result.append(row[center])
    else:
        center = len(matrix[0]) // 2
        for row in matrix:
            result.append(row[center])
    return result

matrix = [[1,2,3],[4,5,6],[7,8,9]]
print(center_column(matrix))
matrix = [[1,2,3,4],[5,6,7,8],[9,10,11,12]]
print(center_column(matrix))
```

```
[2, 5, 8]
[3, 7, 11]
>
```

```python
"""Q6. Print the centre column of the matrix"""

def sum_matrix(matrix):
    row_sum = []
    for row in matrix:
        row_sum.append(sum(row))
    col_sum = []
    for i in range(len(matrix[0])):
        col_sum.append(sum(matrix[j][i] for j in range(len(matrix))))
    return (row_sum, col_sum)

matrix = [[1,2,3],[4,5,6],[7,8,9]]
print(sum_matrix(matrix))
```

```
([6, 15, 24], [12, 15, 18])
>
```

```python
"""Q7. Fizzbuzz program"""

def fizzbuzz(n):
    result = []
    for i in range(1, n + 1):
        if i % 3 == 0 and i % 5 == 0:
            result.append("fizzbuzz")
        elif i % 3 == 0:
            result.append("fizz")
        elif i % 5 == 0:
            result.append("buzz")
        else:
            result.append(i)
    return result

n = 15
print(fizzbuzz(n))
```

```
[1, 2, 'fizz', 4, 'buzz', 'fizz', 7, 8, 'fizz', 'buzz', 11, 'fizz', 13, 14,
    'fizzbuzz']
>
```