Batch:A3 **Experiment Number: 4**

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Aim of the Experiment: To study Greedy Programming approach for implementation of problem statement to obtain optimal solution.

Program/ Steps:

```
def min_sum_numbers(N):
    N = str(N)

    freq = [0] * 10
    for digit in N:
        freq[int(digit)] += 1

    X = []
    Y = []

    for digit in range(10):
        count = freq[digit]

        half = count // 2

        X.extend([str(digit)] * half)
        Y.extend([str(digit)] * half)

        if count % 2:
            X.append(str(digit))
```

```
    if not X:
        X = ['0']
    if not Y:
        Y = ['0']

    X.sort()
    Y.sort()

    while len(X) > 1 and X[0] == '0':
        X.append(X.pop(0))
    while len(Y) > 1 and Y[0] == '0':
        Y.append(Y.pop(0))

    return int(''.join(X)) + int(''.join(Y))


def solve_test_cases():
    T = int(input())
    results = []

    for _ in range(T):
        N = int(input())
        result = min_sum_numbers(N)
        results.append(result)
```

```
    return results



def test():
    test_cases = [
        2,
        1321,
        42255
    ]

    print("Test Cases:")
    for N in test_cases:
        result = min_sum_numbers(N)
        print(f"Input: {N}")
        print(f"Output: {result}\n")


if __name__ == "__main__":
    test()
```

Output/Result:

```
D:\PyCharm\MyProjects\contest995\.venv\Scripts\python.exe
Test Cases:
Input: 2
Output: 2

Input: 1321
Output: 124

Input: 42255
Output: 270


Process finished with exit code 0
```

Post Lab Question-Answers:

None.

Outcomes:

Understand the fundamental concepts for managing the data using different data structures such as lists, queues, trees etc.

Conclusion (based on the Results and outcomes achieved):

Succesfully demonstrated usage of a greedy algorithm approach with a program in Python.

References:

1. https://tutorialspoint.dev/algorithm/greedy-algorithms/greedy-algorithm-to-find-minimum-number-of-coins
2. https://www.baeldung.com/cs/min-number-of-coins-algorithm