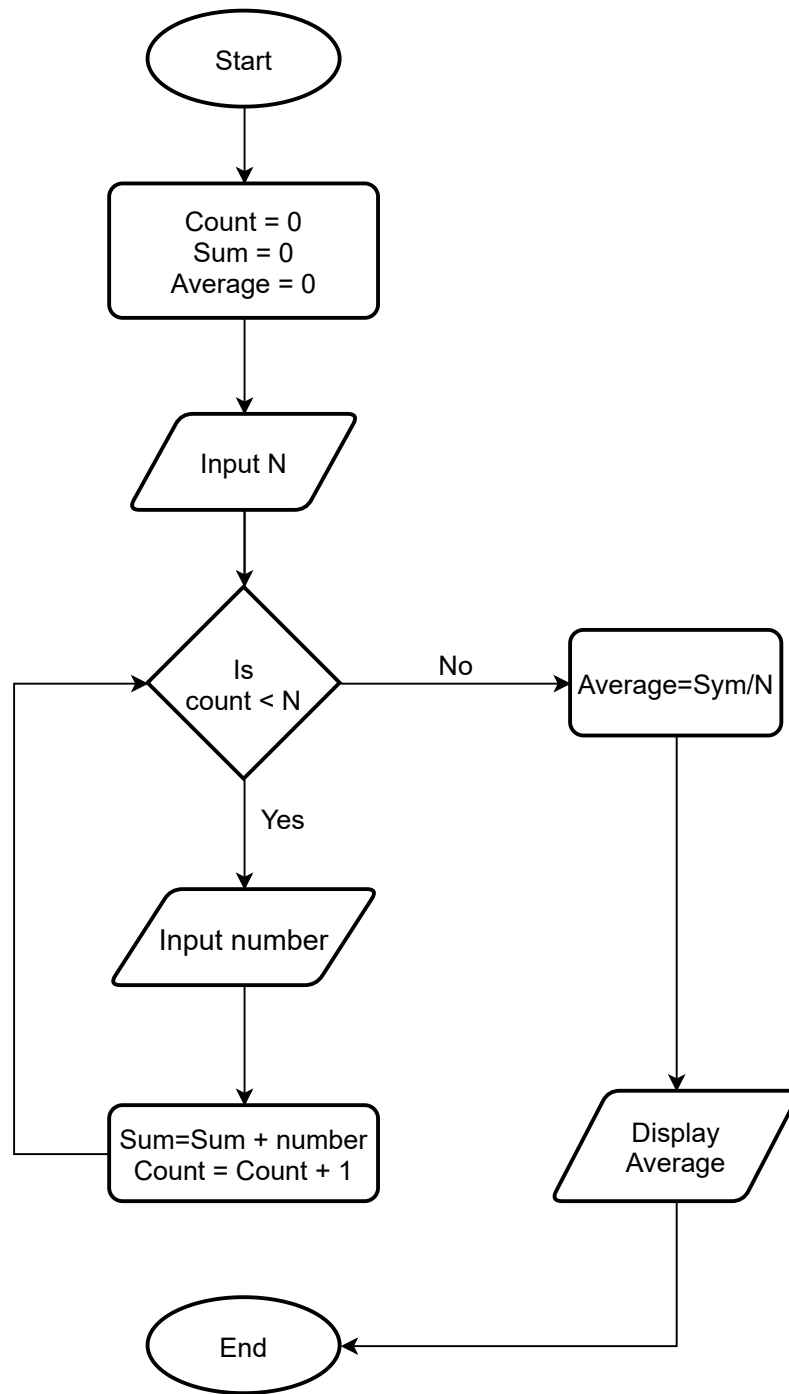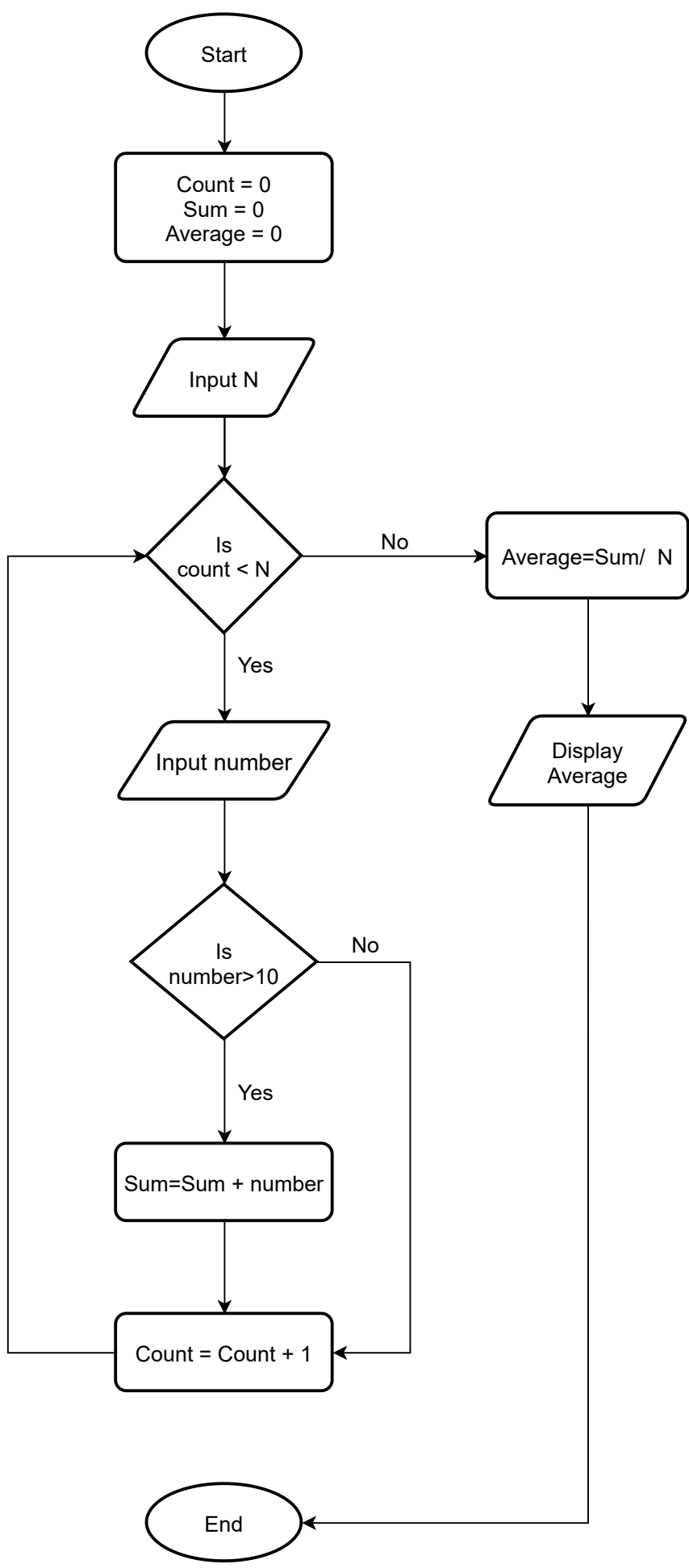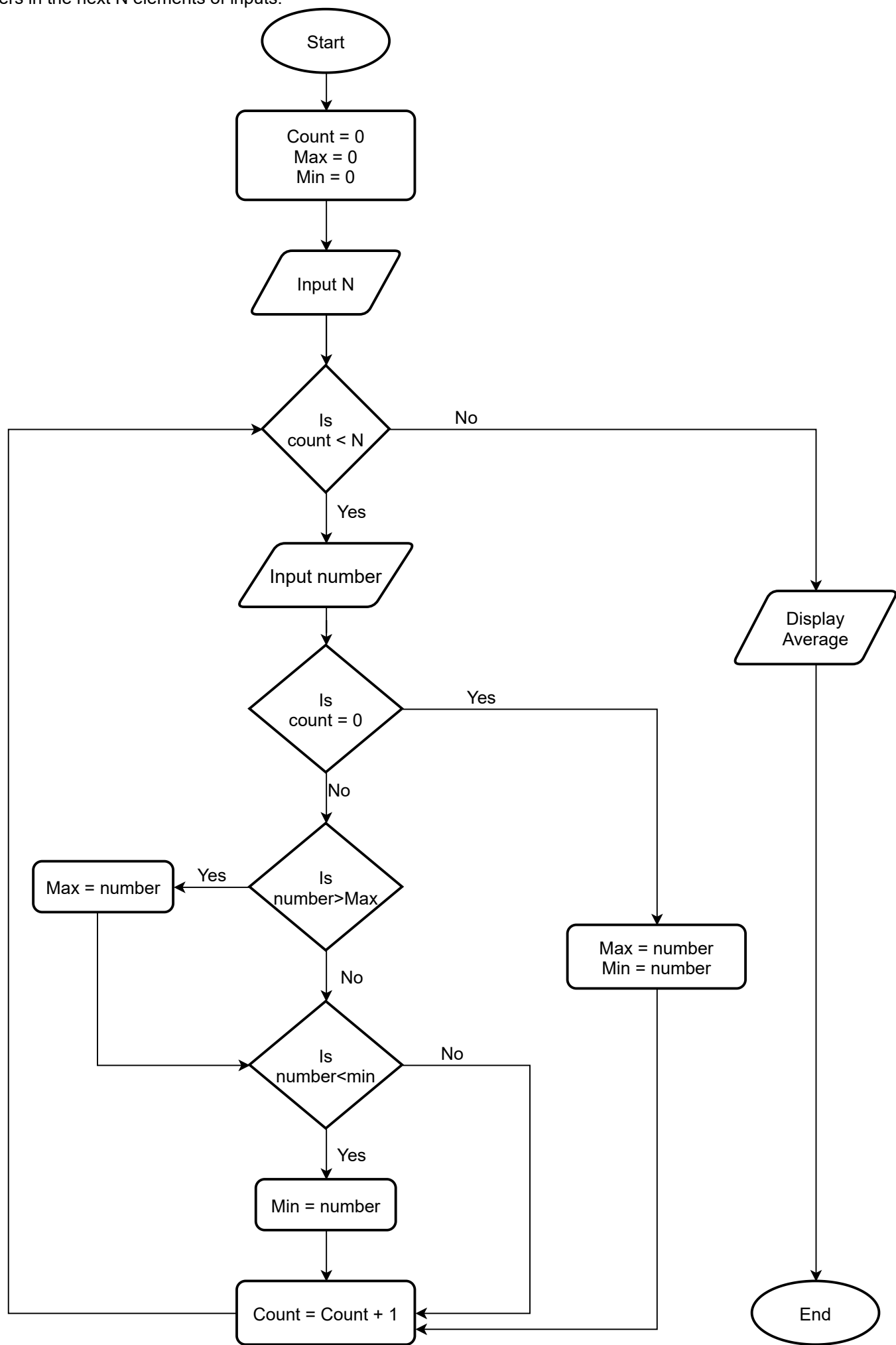1. Design a program that reads a value of N and then compute the average of the Next
N elements of inputs.

```
                        ┌─────────────┐
                        │    Start    │
                        └─────────────┘
                               │
                               ▼
                     ┌───────────────────┐
                     │    Count = 0      │
                     │    Sum = 0        │
                     │   Average = 0     │
                     └───────────────────┘
                               │
                               ▼
                       ╱──────────────╲
                      ╱    Input N     ╲
                      ╲                ╱
                       ╲──────────────╱
                               │
                               ▼
                            ◇ Is ◇              No        ┌──────────────────┐
                          ◇ count < N ◇  ─────────────▶  │  Average=Sym/N   │
                            ◇     ◇                       └──────────────────┘
                               │                                  │
                              Yes                                 │
                               │                                  │
                               ▼                                  ▼
                       ╱──────────────╲                   ╱──────────────╲
                      ╱  Input number  ╲                 ╱    Display     ╲
                      ╲                ╱                 ╲    Average      ╱
                       ╲──────────────╱                  ╲──────────────╱
                               │                                  │
                               ▼                                  │
                     ┌───────────────────┐                       │
                     │ Sum=Sum + number  │                       │
                     │  Count = Count + 1│                       │
                     └───────────────────┘                       │
                                                                  ▼
                        ┌─────────────┐                           
                        │     End     │◀──────────────────────────
                        └─────────────┘
```
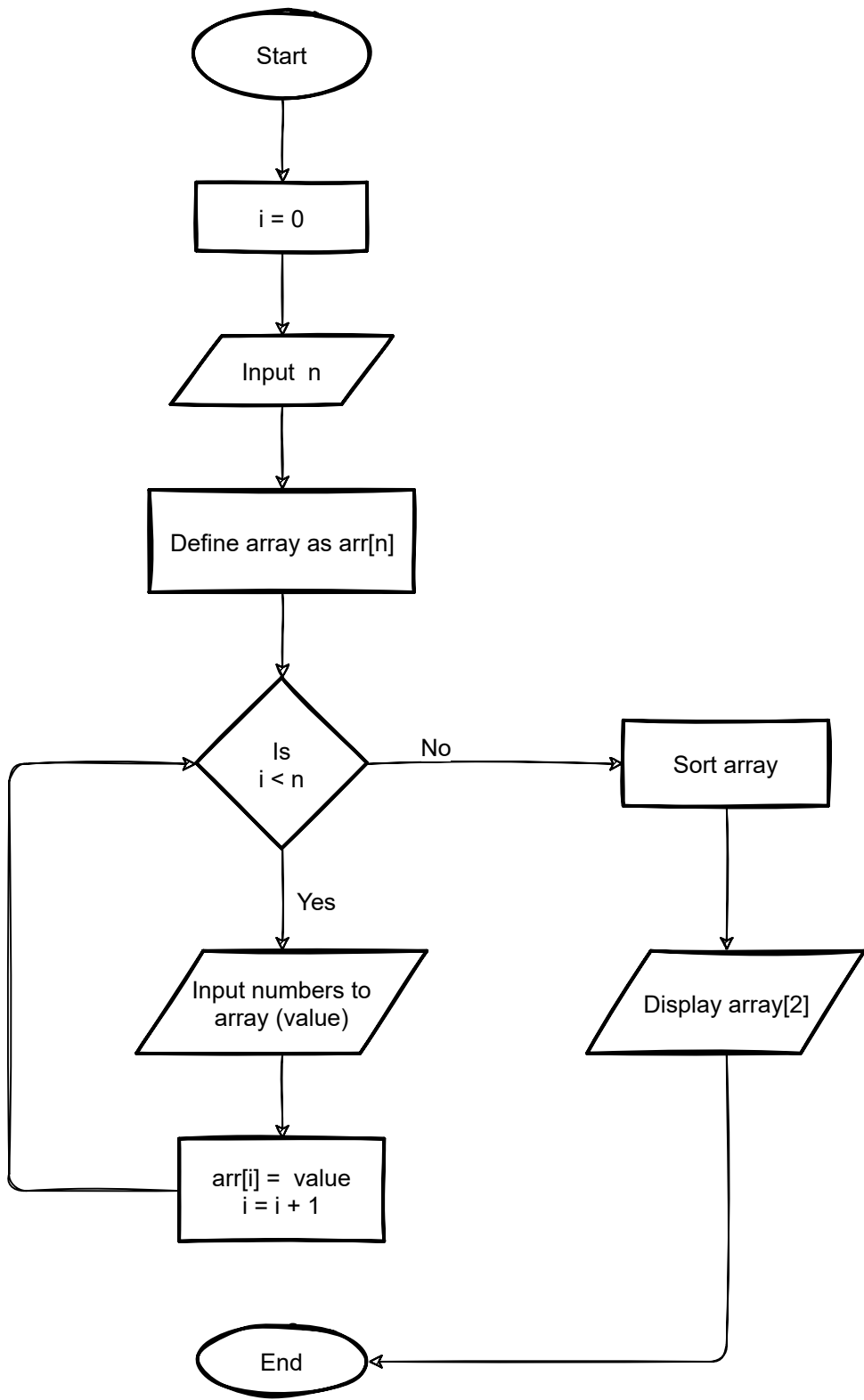
2. Revise your program from question 1 so that now it computes only the average of those input items that are greater than 10.

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │  Count = 0  │
                    │   Sum = 0   │
                    │ Average = 0 │
                    └─────────────┘
                           │
                           ▼
                    ╱─────────────╲
                    │   Input N    │
                    ╲─────────────╱
                           │
                           ▼
                        ◇ Is ◇        No      ┌──────────────┐
                        ◇ count < N ◇ ──────▶ │ Average=Sum/ N│
                        ◇        ◇            └──────────────┘
                           │                         │
                          Yes                        ▼
                           │                  ╱──────────────╲
                           ▼                  │   Display     │
                    ╱──────────────╲          │   Average     │
                    │ Input number  │         ╲──────────────╱
                    ╲──────────────╱                 │
                           │                         │
                           ▼                         │
                        ◇ Is ◇        No             │
                        ◇ number>10 ◇ ───┐           │
                        ◇        ◇       │           │
                           │             │           │
                          Yes            │           │
                           ▼             │           │
                    ┌──────────────────┐ │           │
                    │ Sum=Sum + number │ │           │
                    └──────────────────┘ │           │
                           │             │           │
                           ▼             │           │
                    ┌──────────────────┐ │           │
                    │ Count = Count + 1 │◀┘          │
                    └──────────────────┘             │
                           │                         │
                           ▼                         │
                    ┌─────────────┐                  │
                    │     End     │ ◀────────────────┘
                    └─────────────┘
```

Start

Count = 0
Sum = 0
Average = 0

Input N

Is count < N — No → Average=Sum/ N

Yes

Input number

Is number>10 — No
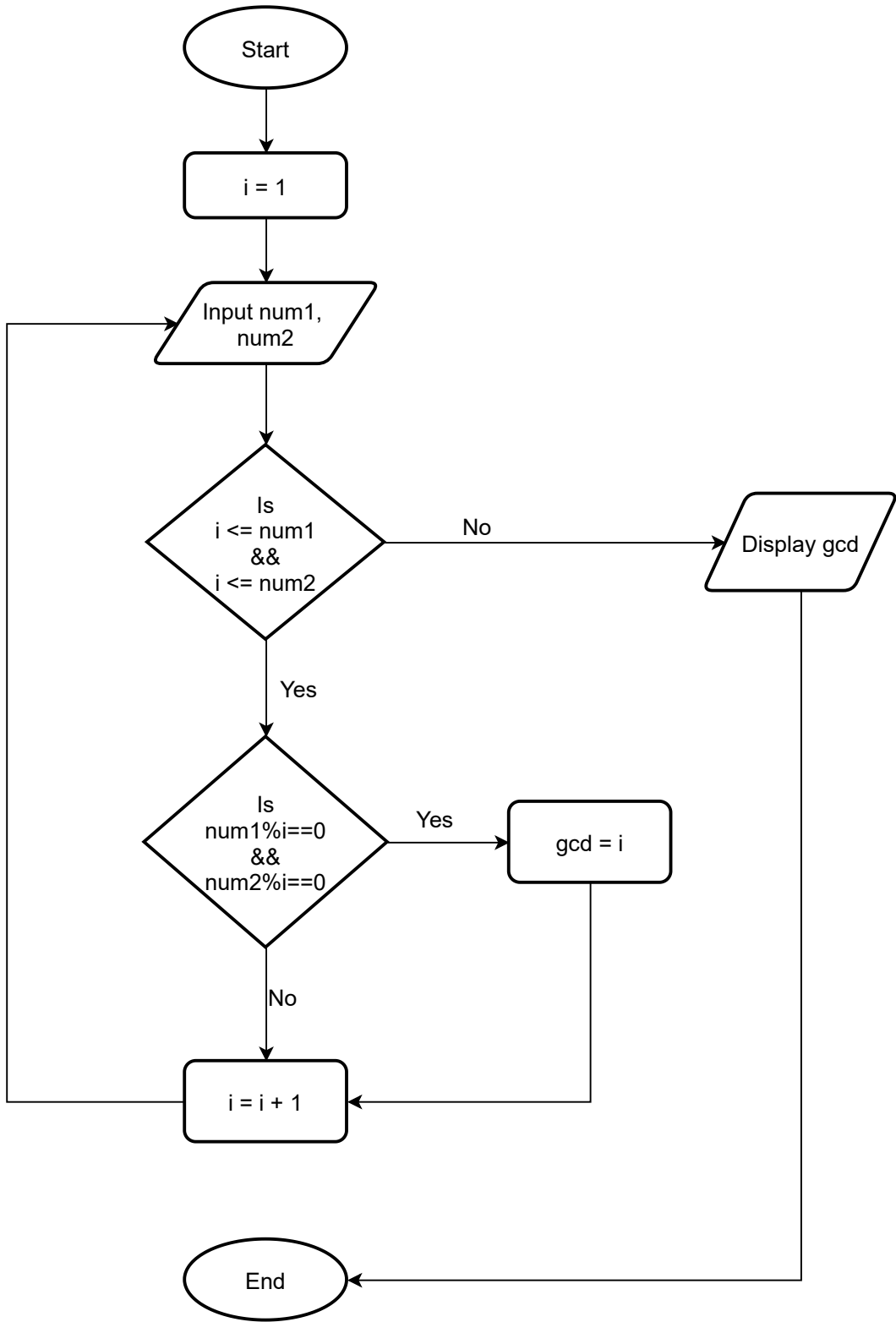
Yes

Sum=Sum + number

Count = Count + 1

Display Average

End

3. Design a program that reads a value of N and then computes the smallest and the largest numbers in the next N elements of inputs.

```
           ( Start )
              |
     +-------------------+
     |    Count = 0      |
     |    Max = 0        |
     |    Min = 0        |
     +-------------------+
              |
        / Input N /
              |
          < Is count < N >  --No-->  / Display Average /  -->  ( End )
              |
            Yes
              |
       / Input number /
              |
          < Is count = 0 >  --Yes-->  +-------------------+
              |                        |   Max = number    |
             No                        |   Min = number    |
              |                        +-------------------+
          < Is number>Max >  --Yes-->  [ Max = number ]
              |
             No
              |
          < Is number<min >  --No-->
              |
            Yes
              |
       [ Min = number ]
              |
       [ Count = Count + 1 ]
```

4. Design a program that reads a value of N and then computes the THIRD smallest number in the next N elements of inputs.

```
          ( Start )
             │
             ▼
        ┌─────────┐
        │  i = 0  │
        └─────────┘
             │
             ▼
         / Input n /
             │
             ▼
    ┌──────────────────────┐
    │ Define array as arr[n] │
    └──────────────────────┘
             │
             ▼
           /  Is  \         No      ┌───────────┐
          <  i < n  >──────────────>│ Sort array │
           \      /                 └───────────┘
             │                            │
            Yes                           │
             │                            ▼
             ▼                    / Display array[2] /
   / Input numbers to /                   │
   /  array (value)   /                   │
             │                            │
             ▼                            │
    ┌──────────────────┐                  │
    │ arr[i] =  value  │                  │
    │   i = i + 1      │                  │
    └──────────────────┘                  │
                                          │
          ( End )◄────────────────────────┘
```

5. Design a function to compute the greatest common divisor of two integers read from input data.

```
Start
  |
i = 1
  |
Input num1, num2
  |
Is i <= num1 && i <= num2 ?
  -- No --> Display gcd --> End
  -- Yes -->
    Is num1%i==0 && num2%i==0 ?
      -- Yes --> gcd = i --> i = i + 1
      -- No --> i = i + 1
    (i = i + 1 loops back to Input num1, num2)
```

6. Design a function to compute the smallest common factor of two integers read from input data.

```
              ( Start )
                  |
                  v
              [ i = 1 ]
                  |
                  v
          / Input num1, /
          /   num2     /
                  |
                  v
              < Is
            i <= num1
               &&          --- No --->  [ scf=(num1*num2)/gdc ]
            i <= num2 >                          |
                  |                              |
                 Yes                             |
                  |                              |
                  v                              |
              < Is                               |
          num1%i==0                              |
              &&          --- Yes --->  [ gcd = i ]
          num2%i==0 >                           |
                  |                              |
                 No                             |
                  |                              |
                  v                              v
          [ i = i + 1 ] <----------------       / Display gcd /
                  |                                     |
                  ^ (loop back to Input)                |
                                                        v
                                                   ( End )
```