

# Problem 2

Sort the array  $A = [4, 6, 3, 5, 0, 5, 1, 3, 5, 5]$  using counting sort.

- 1. After the first loop, the index,  $i$ , corresponds to the number of times  $i$  occurs in  $A$ .

Index Value

|   |   |
|---|---|
| 0 | 1 |
| 1 | 1 |
| 2 | 0 |
| 3 | 2 |
| 4 | 1 |
| 5 | 4 |
| 6 | 1 |

- 2. After the second loop, the array  $C$  represents, at each index,  $i$ , the number of items that are greater than or equal to the value of  $C[i]$ . Since all the items in the list must be less than or equal to the maximum of the list,  $C[\text{last}] = A.\text{length}$ .

Index Value

|   |    |
|---|----|
| 0 | 1  |
| 1 | 2  |
| 2 | 2  |
| 3 | 4  |
| 4 | 5  |
| 5 | 9  |
| 6 | 10 |

- 3. After the third loop,  $C = [0, 1, 2, 2, 4, 5, 9]$
- 4. Sorted array =  $[0, 1, 3, 3, 4, 5, 5, 5, 5, 6]$