**Divide and Conquer**

**Week 3:**

**Program 1:**

**Aim:**

To implement a program using the Divide and Conquer approach to count the number of zeroes in an array consisting of all 1s followed by all 0s.

**Input:**

* An integer m, the size of the array.
* m integers representing the elements of the array (1s followed by 0s).

**Code:**

#include <stdio.h>

int findFirstZero(int arr[], int low, int high) {

if (high >= low) {

int mid = low + (high - low) / 2;

if ((mid == 0 || arr[mid - 1] == 1) && arr[mid] == 0)

return mid;

if (arr[mid] == 1)

return findFirstZero(arr, mid + 1, high);

return findFirstZero(arr, low, mid - 1);

}

return -1;

}

int main() {

int m;

scanf("%d", &m);

int arr[m];

for (int i = 0; i < m; i++) {

scanf("%d", &arr[i]);

}

int firstZeroIndex = findFirstZero(arr, 0, m - 1);

if (firstZeroIndex == -1) {

printf("0\n");

}

else {

int numZeroes = m - firstZeroIndex;

printf("%d\n", numZeroes);

}

return 0;

}

**Output:**

