**Reg. No: 21BCE1297** **Name: Vidhi Shah** **Date: 24/03/22**

# PPS9

## Q1

## Aim:

Given an array of size N, write a C program using pointer arithmetic to find the sum of the digits of all array elements which contains even number of 1's in their equivalent binary representation. If there is no such element with even number of 1's, print -1.

## Procedure:

### Input:

A number, 'n'
'n' array elements

### Output:

Sum of digits of all elements from array that satisfies the condition else -1

### Algorithm:

Step 1: Declare 'binary', 'eveodd' and 'digitsum' function with return type 'int' and argument 'int n'

**Main Function**

Step 1: Initialise integer variables 'n' and 'i' and read 'n'.
Step 2: Initialise and read an integer array of size n, 'arr'.
Step 3: Initialise an integer pointer variable, 'ptr', and assign 'arr' to it.
Step 4: Initialise 'sum' to 0, declare 'r'
Step 5: For each element of the array
    Step A: Pass element in 'binary function' using pointer reference
    Step B: Pass the binary number obtained in 'eveodd function' and store the return value in 'r'
    Step C: If r is equal to 1
        Then pass the element in 'digitsum function' using pointer reference and add the return value to 'sum'
    Step D: Increment 'ptr' by 1
Step 6: If 'sum' is equal to 0
    Print -1
    Else
    Print 'sum'
Step 7: Return 0

**Binary Function**

Step 1: Initialise ‘i' to 0, ‘b’ to 1 and declare ‘r’
Step 2: While n > 0
    Step A: r = n%2
    Step B: b += r*i
    Step C: i *= 10
    Step D: n /= 2
Step 3: Return b

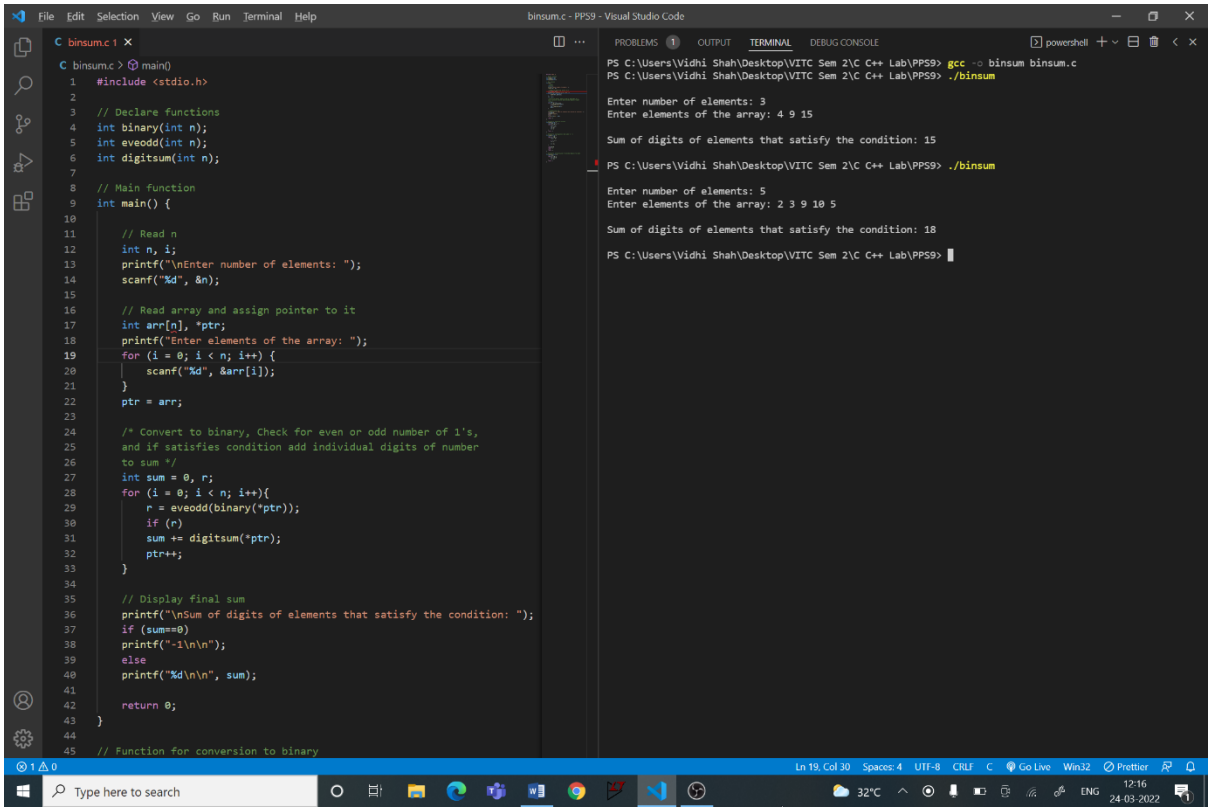
**Eveodd Function**

Step 1: Initialise ‘c' to 0 and declare ‘r’
Step 2: While n > 0
    Step A: r = n%10
    Step B: If r is equal to 1
        Increment c by 1
    Step C: n /= 10
Step 3: If c is even
    Return 0
    Else
    Return 1

**Digitsum Function**

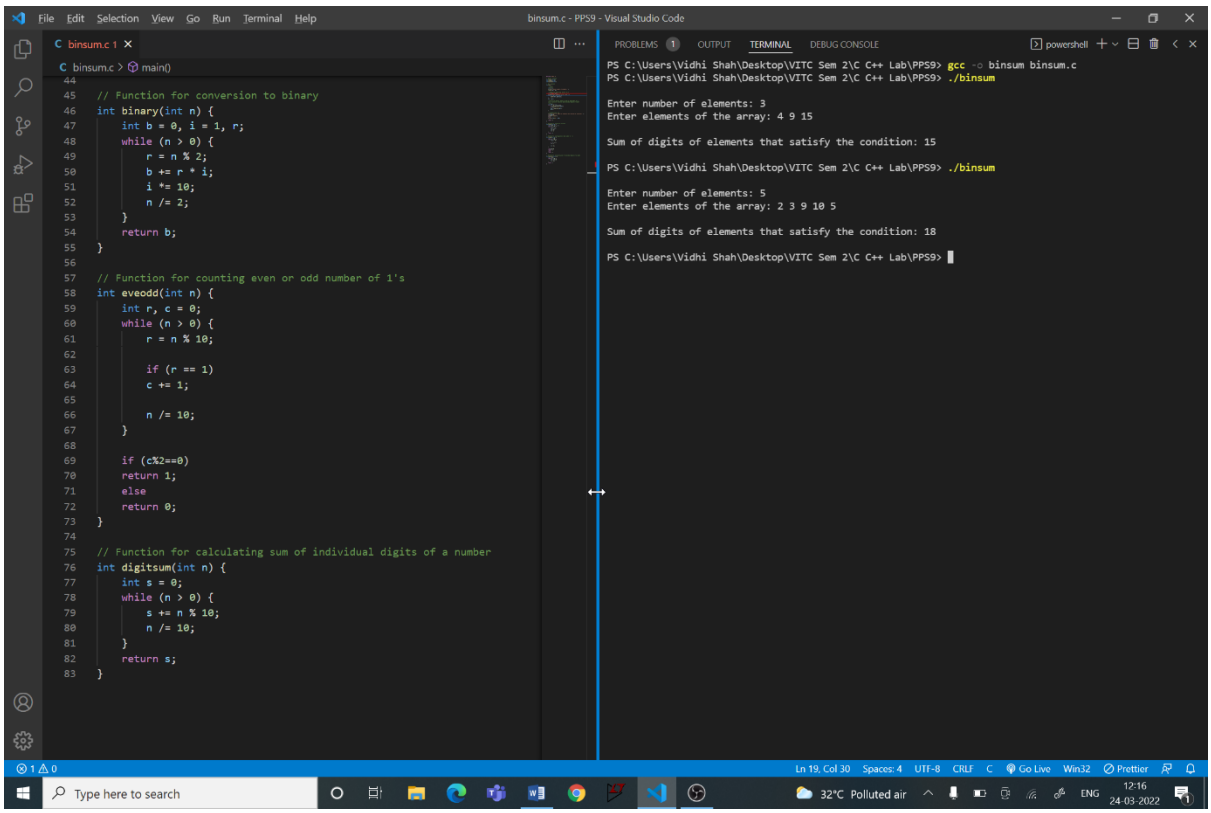
Step 1: Initialise ‘s’ to 0
Step 2: While n > 0
    s += n % 10
    n /= 10
Step 3: Return s

# Code:



```c
#include <stdio.h>

// Declare functions
int binary(int n);
int eveodd(int n);
int digitsum(int n);

// Main function
int main() {

    // Read n
    int n, i;
    printf("\nEnter number of elements: ");
    scanf("%d", &n);

    // Read array and assign pointer to it
    int arr[n], *ptr;
    printf("Enter elements of the array: ");
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    ptr = arr;

    /* Convert to binary, Check for even or odd number of 1's,
    and if satisfies condition add individual digits of number
    to sum */
    int sum = 0, r;
    for (i = 0; i < n; i++){
        r = eveodd(binary(*ptr));
        if (r)
        sum += digitsum(*ptr);
        ptr++;
    }

    // Display final sum
    printf("\nSum of digits of elements that satisfy the condition: ");
    if (sum==0)
    printf("-1\n\n");
    else
    printf("%d\n\n", sum);

    return 0;
}

// Function for conversion to binary
```

```
PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C C++ Lab\PPS9> gcc -o binsum binsum.c
PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C C++ Lab\PPS9> ./binsum

Enter number of elements: 3
Enter elements of the array: 4 9 15

Sum of digits of elements that satisfy the condition: 15

PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C C++ Lab\PPS9> ./binsum

Enter number of elements: 5
Enter elements of the array: 2 3 9 10 5

Sum of digits of elements that satisfy the condition: 18

PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C C++ Lab\PPS9>
```



```c
// Function for conversion to binary
int binary(int n) {
    int b = 0, i = 1, r;
    while (n > 0) {
        r = n % 2;
        b += r * i;
        i *= 10;
        n /= 2;
    }
    return b;
}

// Function for counting even or odd number of 1's
int eveodd(int n) {
    int r, c = 0;
    while (n > 0) {
        r = n % 10;

        if (r == 1)
        c += 1;

        n /= 10;
    }

    if (c%2==0)
    return 1;
    else
    return 0;
}

// Function for calculating sum of individual digits of a number
int digitsum(int n) {
    int s = 0;
    while (n > 0) {
        s += n % 10;
        n /= 10;
    }
    return s;
}
```

```
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PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C C++ Lab\PPS9>
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int binary(int n);
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int main() {

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    int n, i;
    printf("\nEnter number of elements: ");
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    // Read array and assign pointer to it
    int arr[n], *ptr;
    printf("Enter elements of the array: ");
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    ptr = arr;

    /* Convert to binary, Check for even or odd number of 1's,
    and if satisfies condition add individual digits of number
    to sum */
    int sum = 0, r;
    for (i = 0; i < n; i++){
        r = eveodd(binary(*ptr));
        if (r)
        sum += digitsum(*ptr);
        ptr++;
    }

    // Display final sum
    printf("\nSum of digits of elements that satisfy the condition: ");
    if (sum==0)
    printf("-1\n\n");
    else
    printf("%d\n\n", sum);

    return 0;
}
```

```c
// Function for conversion to binary
int binary(int n) {
    int b = 0, i = 1, r;
    while (n > 0) {
        r = n % 2;
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int eveodd(int n) {
    int r, c = 0;
    while (n > 0) {
        r = n % 10;

        if (r == 1)
        c += 1;

        n /= 10;
    }

    if (c%2==0)
    return 1;
    else
    return 0;
}

// Function for calculating sum of individual digits of a number
int digitsum(int n) {
    int s = 0;
    while (n > 0) {
        s += n % 10;
        n /= 10;
    }
    return s;
}
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