NITHIN S
221IT085

CS111 Lab Assignment 5

Q1) WAP to generate all combinations of 1, 2 and 3 without repetition and without using standard formulas.

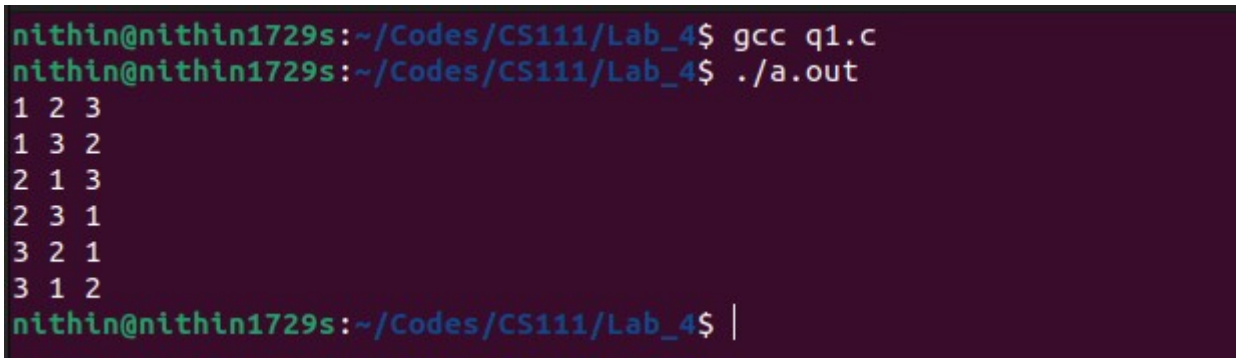
```
#include <stdio.h>

void swap(int *a, int *b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}

void generateCombinations(int arr[], int start, int end)
{
    if (start == end) {
        for (int i = 0; i <= end; i++) {
            printf("%d ", arr[i]);
        }
        printf("\n");
    } else {
        for (int i = start; i <= end; i++) {
            swap(&arr[start], &arr[i]);
            generateCombinations(arr, start + 1, end);
            swap(&arr[start], &arr[i]);
        }
    }
}

int main() {
    int n = 3;
    int arr[n];
    for (int i = 0; i < n; i++) {
```

```
        arr[i] = i + 1;
    }
    generateCombinations(arr, 0, n - 1);
    return 0;
}
```



Q2) Write a C program to find the sum of the first and last digit of a number using a loop.

```
#include <stdio.h>

int main() {
    int number, firstDigit, lastDigit;


    printf("Enter a number: ");
    scanf("%d", &number);


    lastDigit = number % 10;


    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;


    int sum = firstDigit + lastDigit;
    printf("Sum of the first and last digits: %d\n",
sum);

    return 0;
}
```

```
nithin@nithin1729s:~/Codes/CS111/Lab_4$ gcc q2.c
nithin@nithin1729s:~/Codes/CS111/Lab_4$ ./a.out
Enter a number: 678
Sum of the first and last digits: 14
nithin@nithin1729s:~/Codes/CS111/Lab_4$
```

Q3) Write a C program to print numbers in words.

```
#include <stdio.h>

int main() {
    char number[50];

    printf("Enter any number to print in words: ");
    scanf("%s", number);

    printf("In words: ");

    for (int i = 0; number[i] != '\0'; i++) {
        if (number[i] >= '0' && number[i] <= '9') {
            int digit = number[i] - '0';
            switch (digit) {
                case 0:
                    printf("Zero ");
                    break;
                case 1:
                    printf("One ");
                    break;
                case 2:
                    printf("Two ");
                    break;
                case 3:
                    printf("Three ");
                    break;
                case 4:
                    printf("Four ");
                    break;
                case 5:
                    printf("Five ");
                    break;
                case 6:
                    printf("Six ");
                    break;
                case 7:
                    printf("Seven ");
                    break;
                case 8:
```

```
                    printf("Eight ");
                    break;
                case 9:
                    printf("Nine ");
                    break;
            }
        }
    }

    printf("\n");

    return 0;
}
```

```
nithin@nithin1729s:~/Codes/CS111/Lab_4$ gcc q3.c
nithin@nithin1729s:~/Codes/CS111/Lab_4$ ./a.out
Enter any number to print in words: 678
In words: Six Seven Eight
nithin@nithin1729s:~/Codes/CS111/Lab_4$
```

Q4) Write a program in C to separate odd and even integers in separate arrays

```
#include <stdio.h>

int main() {
    int n;
    printf("Input the number of elements to be stored in
the array: ");
    scanf("%d", &n);

    if (n <= 0) {
        printf("Invalid input for the number of
elements.\n");
        return 1;
    }

    int arr[n];
    int even[n], odd[n];
    int evenCount = 0, oddCount = 0;

    printf("Input %d elements in the array: ", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
        if (arr[i] % 2 == 0) {
            even[evenCount] = arr[i];
            evenCount++;
        } else {
            odd[oddCount] = arr[i];
            oddCount++;
        }
    }


    printf("The Even elements are:\n");
    for (int i = 0; i < evenCount; i++) {
        printf("%d ", even[i]);
    }
    printf("\n");

    printf("The Odd elements are:\n");
    for (int i = 0; i < oddCount; i++) {
        printf("%d ", odd[i]);
```

```
    }
    printf("\n");

    return 0;
}
```

```
nithin@nithin1729s:~/Codes/CS111/Lab_4$ gcc q4.c
nithin@nithin1729s:~/Codes/CS111/Lab_4$ ./a.out
Input the number of elements to be stored in the array: 6
Input 6 elements in the array: 2 5 7 3 4 6
The Even elements are:
2 4 6
The Odd elements are:
5 7 3
nithin@nithin1729s:~/Codes/CS111/Lab_4$
```

Q5) Write a program in C to calculate the Determinant of a 3x3 matrix.

```
#include <stdio.h>

int main() {
    int matrix[3][3];
    int determinant = 0;


    printf("Enter the elements of the 3x3 matrix row-
wise:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }


    determinant = (matrix[0][0] * ((matrix[1][1] *
matrix[2][2]) - (matrix[1][2] * matrix[2][1]))) -
                  (matrix[0][1] * ((matrix[1][0] *
matrix[2][2]) - (matrix[1][2] * matrix[2][0]))) +
                  (matrix[0][2] * ((matrix[1][0] *
matrix[2][1]) - (matrix[1][1] * matrix[2][0])));


    printf("The determinant of the 3x3 matrix is: %d\n",
determinant);

    return 0;
}
```

```
nithin@nithin1729s:~/Codes/CS111/Lab_4$ gcc q5.c
nithin@nithin1729s:~/Codes/CS111/Lab_4$ ./a.out
Enter the elements of the 3x3 matrix row-wise:
4 5 6
7 8 2
1 1 1
The determinant of the 3x3 matrix is: -7
nithin@nithin1729s:~/Codes/CS111/Lab_4$
```