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CS111 Lab Assignment 3

Q1) 1. Admission to a professional course in subject to the following conditions:
a) Marks in mathematics >=60
b) Marks in Physics >=50
c) Marks in Chemistry >=40
d) Total in all three subjects >=200
Or
Total in mathematics and physics>=150.
Given the marks in the three subjects, write a program to process the applications to the eligible candidates using conditional operators.

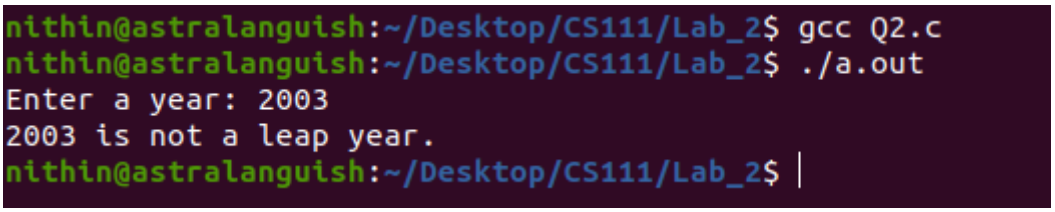
```
#include <stdio.h>

int main() {
    int mathMarks, physicsMarks, chemistryMarks;

    printf("Enter marks in Mathematics: ");
    scanf("%d", &mathMarks);

    printf("Enter marks in Physics: ");
    scanf("%d", &physicsMarks);

    printf("Enter marks in Chemistry: ");
    scanf("%d", &chemistryMarks);

    if ((mathMarks >= 60 && physicsMarks >= 50 &&
chemistryMarks >= 40 && mathMarks + physicsMarks +
chemistryMarks >= 200) || (mathMarks + physicsMarks >=
150)) {
        printf("Congratulations! You are eligible for
admission.\n");
    } else {
```

```
        printf("Sorry, you are not eligible for
admission.\n");
    }

    return 0;
}
```

```
nithin@astralanguish:~/Desktop/CS111/Lab_2$ gcc Q1.c
nithin@astralanguish:~/Desktop/CS111/Lab_2$ ./a.out
Enter marks in Mathematics: 98
Enter marks in Physics: 99
Enter marks in Chemistry: 89
Congratulations! You are eligible for admission.
nithin@astralanguish:~/Desktop/CS111/Lab_2$
```

Q2) Program to check whether given year is leap year or not using IF-ELSE

```
#include <stdio.h>

int main() {
    int year;


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

    if ((year % 4 == 0 && year % 100 != 0) || (year % 400
== 0)) {
        printf("%d is a leap year.\n", year);
    } else {
        printf("%d is not a leap year.\n", year);
    }

    return 0;
}
```



Q3) A shop will give a discount of 10% if the cost of purchased quantity is more than Rs.1000. Ask the user for quantity, suppose, one unit costs Rs.100. judge and print total cost for the user.

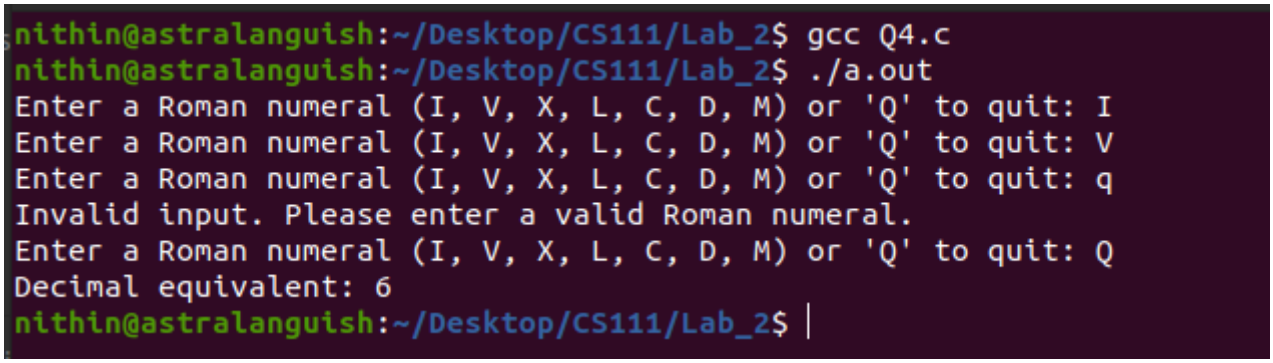
```c
#include <stdio.h>

int main() {
    int quantity;
    float costPerUnit = 100.0;
    float totalCost;


    printf("Enter the quantity of items: ");
    scanf("%d", &quantity);

    totalCost = quantity * costPerUnit;

    if (totalCost > 1000) {
        totalCost *= 0.9;
    }


    printf("Total cost: Rs. %.2f\n", totalCost);

    return 0;
}
```

```
nithin@astralanguish:~/Desktop/CS111/Lab_2$ gcc Q3.c
nithin@astralanguish:~/Desktop/CS111/Lab_2$ ./a.out
Enter the quantity of items: 3
Total cost: Rs. 300.00
nithin@astralanguish:~/Desktop/CS111/Lab_2$
```

Q4) Write a program that takes a Roman numeral (I, V, X, L, C, D, M) as input and uses a switch-case statement to convert it to a decimal number repeat the steps until user enters invalid case.(use goto)

```
#include <stdio.h>

int main() {
    char romanNumeral;
    int decimalNumber = 0;


    while (1) {
        printf("Enter a Roman numeral (I, V, X, L, C, D,
M) or 'Q' to quit: ");
        scanf(" %c", &romanNumeral);


        switch (romanNumeral) {
            case 'I':
                decimalNumber += 1;
                break;
            case 'V':
                decimalNumber += 5;
                break;
            case 'X':
                decimalNumber += 10;
                break;
            case 'L':
                decimalNumber += 50;
                break;
            case 'C':
                decimalNumber += 100;
                break;
            case 'D':
                decimalNumber += 500;
                break;
            case 'M':
                decimalNumber += 1000;
                break;
            case 'Q':
```

```
                goto end;
            default:
                printf("Invalid input. Please enter a
valid Roman numeral.\n");
        }
    }

    end:

    printf("Decimal equivalent: %d\n", decimalNumber);

    return 0;
}
```



Q5) Write a program that takes coefficients of a quadratic equation as input and uses if-else statements to determine and print the roots of the quadratic equation.

```
#include <stdio.h>
#include <math.h>

int main() {
    double a, b, c;
    double discriminant, root1, root2;


    printf("Enter the coefficients of the quadratic
equation (a, b, c): ");
    scanf("%lf %lf %lf", &a, &b, &c);

    discriminant = b * b - 4 * a * c;


    if (discriminant > 0) {

        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("Root 1 = %.2lf\n", root1);
        printf("Root 2 = %.2lf\n", root2);
    } else if (discriminant == 0) {

        root1 = -b / (2 * a);
        printf("Root 1 = Root 2 = %.2lf\n", root1);
    } else {

        double realPart = -b / (2 * a);
        double imaginaryPart = sqrt(-discriminant) / (2 *
a);
        printf("Root 1 = %.2lf + %.2lfi\n", realPart,
imaginaryPart);
        printf("Root 2 = %.2lf - %.2lfi\n", realPart,
imaginaryPart);
    }

    return 0;
}
```

```
nithin@astralanguish:~/Desktop/CS111/Lab_2$ gcc Q5.c -lm
nithin@astralanguish:~/Desktop/CS111/Lab_2$ ./a.out
Enter the coefficients of the quadratic equation (a, b, c): 3
4
3
Root 1 = -0.67 + 0.75i
Root 2 = -0.67 - 0.75i
nithin@astralanguish:~/Desktop/CS111/Lab_2$
```

Q6) Write a program to take an integer number from the user and print the sum of the digits entered.(do not use for, while,do_while)

```
#include <stdio.h>


int sumOfDigits(int num) {
    if (num == 0) {
        return 0;
    }
    return (num % 10) + sumOfDigits(num / 10);
}

int main() {
    int number;


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

    int sum = sumOfDigits(number);
    printf("Sum of the digits: %d\n", sum);

    return 0;

}
```

```
nithin@astralanguish:~/Desktop/CS111/Lab_2$ gcc Q6.c
nithin@astralanguish:~/Desktop/CS111/Lab_2$ ./a.out
Enter an integer: 567
Sum of the digits: 18
nithin@astralanguish:~/Desktop/CS111/Lab_2$
```