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CLASS

COMPUTER NETWORKS

FACULTY

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LAB

EXERCISE 4

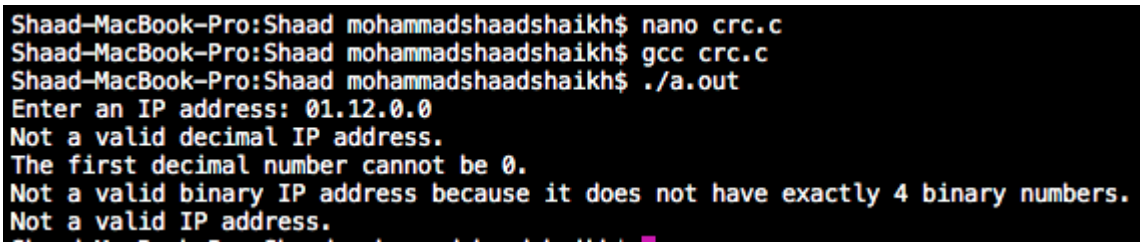
Code

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <stdbool.h>

bool is_decimal_ip(char *ip_address);
bool is_binary_ip(char *ip_address);

int main() {
    char ip_address[20];
    printf("Enter an IP address: ");
    scanf("%s", ip_address);
    if (is_decimal_ip(ip_address)) {
        printf("Valid decimal IP address.\n");
    } else if (is_binary_ip(ip_address)) {
        printf("Valid binary IP address.\n");
    } else {
        printf("Not a valid IP address.\n");
    }
    return 0;
}

bool is_decimal_ip(char *ip_address) {
    int num;
    char *token;
    int count = 0;
    token = strtok(ip_address, ".");
    while (token != NULL) {
        count++;
```

```
        num = atoi(token);
        if (num < 0 || num > 255 || (count == 1 && token[0] ==
'0') || (count > 1 && token[0] == '0')) {
            printf("Not a valid decimal IP address.\n");
            if (num < 0 || num > 255) {
                printf("The number %d is outside the range of
0 to 255.\n", num);
            }
            if (count == 1 && token[0] == '0') {
                printf("The first decimal number cannot be
0.\n");
            }
            if (count > 1 && token[0] == '0') {
                printf("The decimal number %d has a leading
zero.\n", num);
            }
            return false;
        }
        token = strtok(NULL, ".");
    }
    if (count == 4) {
        printf("Valid decimal IP address.\n");
        return true;
    } else {
        printf("Not a valid decimal IP address because it does
not have exactly 4 decimal numbers.\n");
        return false;
    }
}

bool is_binary_ip(char *ip_address) {
```

```
    int num;
    char *token;
    int count = 0;
    token = strtok(ip_address, ".");
    while (token != NULL) {
        count++;
        num = strtol(token, NULL, 2);
        if (num < 0 || num > 255) {
            printf("Not a valid binary IP address.\n");
            if (num < 0 || num > 255) {
                printf("The binary number %s is not a valid
binary number or is outside the range of 0 to 255.\n", token);
            }
            return false;
        }
        token = strtok(NULL, ".");
    }
    if (count == 4) {
        printf("Valid binary IP address.\n");
        return true;
    } else {
        printf("Not a valid binary IP address because it does
not have exactly 4 binary numbers.\n");
        return false;
    }
}
```

Output


Shaad-MacBook-Pro:Shaad mohammadshaadshaikh$ nano crc.c
Shaad-MacBook-Pro:Shaad mohammadshaadshaikh$ gcc crc.c
Shaad-MacBook-Pro:Shaad mohammadshaadshaikh$ ./a.out
Enter an IP address: 01.12.0.0
Not a valid decimal IP address.
The first decimal number cannot be 0.
Not a valid binary IP address because it does not have exactly 4 binary numbers.
Not a valid IP address.