Bansilal Ramnath Agarwal Charitable Trust's

Vishwakarma Institute of Technology,Pune-37

(An Autonomous Institute of Savitribai Phule Pune University)

Assignment 8

Department of Artificial Intelligence and Data Science

Division	A
Batch	1
Rollno	26
Name	Jineshwari Bagul

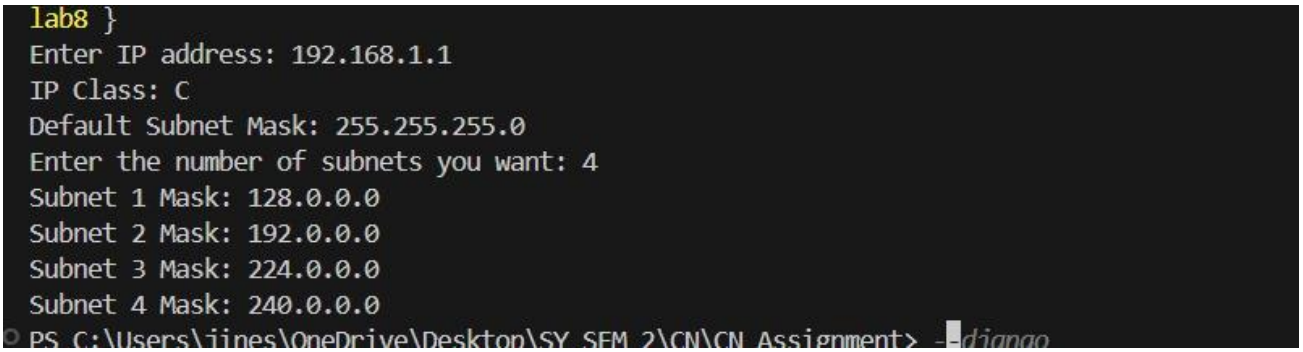
Write a program to demonstrate subnetting and find the subnet masks.

Code :

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

void calculateSubnetMask(int subnetBits, int subnetMask[]) {
    for (int i = 0; i < 4; i++) {
        if (subnetBits >= 8) {
            subnetMask[i] = 255;
            subnetBits -= 8;
        } else if (subnetBits > 0) {
            subnetMask[i] = 256 - (1 << (8 - subnetBits));
            subnetBits = 0;
        } else {
            subnetMask[i] = 0;
        }
    }
}

void printIP(int ip[]) {
    for (int i = 0; i < 4; i++) {
        printf("%d", ip[i]);
        if (i < 3) printf(".");
    }
    printf("\n");
}

char getIPClass(int firstOctet) {
    if (firstOctet >= 1 && firstOctet <= 126) {
        return 'A';
    } else if (firstOctet >= 128 && firstOctet <= 191) {
        return 'B';
    } else if (firstOctet >= 192 && firstOctet <= 223) {
        return 'C';
    } else {
        return 'X';
    }
}

void getDefaultSubnetMask(char ipClass, int subnetMask[]) {
```

```
    if (ipClass == 'A') {
        subnetMask[0] = 255; subnetMask[1] = 0; subnetMask[2] = 0; subnetMask[3] = 0;
    } else if (ipClass == 'B') {
        subnetMask[0] = 255; subnetMask[1] = 255; subnetMask[2] = 0; subnetMask[3] = 0;
    } else if (ipClass == 'C') {
        subnetMask[0] = 255; subnetMask[1] = 255; subnetMask[2] = 255; subnetMask[3] = 0;
    }
}

int main() {
    char ipAddress[16];
    int ip[4], subnetMask[4], numSubnets, subnetBits;

    printf("Enter IP address: ");
    scanf("%s", ipAddress);
    sscanf(ipAddress, "%d.%d.%d.%d", &ip[0], &ip[1], &ip[2], &ip[3]);

    char ipClass = getIPClass(ip[0]);
    if (ipClass == 'X') {
        printf("Invalid or unsupported IP class!\n");
        return 1;
    }

    getDefaultSubnetMask(ipClass, subnetMask);
    printf("IP Class: %c\n", ipClass);
    printf("Default Subnet Mask: ");
    printIP(subnetMask);

    printf("Enter the number of subnets you want: ");
    scanf("%d", &numSubnets);

    subnetBits = 1;  // Start with 1 extra subnet bit

    for (int i = 1; i <= numSubnets; i++) {
        calculateSubnetMask(subnetBits, subnetMask);
        printf("Subnet %d Mask: ", i);
        printIP(subnetMask);
        subnetBits++;  // Increase subnet bits for next subnet
    }

    return 0;
}
```

Output :


lab8 }
Enter IP address: 192.168.1.1
IP Class: C
Default Subnet Mask: 255.255.255.0
Enter the number of subnets you want: 4
Subnet 1 Mask: 128.0.0.0
Subnet 2 Mask: 192.0.0.0
Subnet 3 Mask: 224.0.0.0
Subnet 4 Mask: 240.0.0.0
PS C:\Users\jines\OneDrive\Desktop\SY SEM 2\CN\CN Assignment> --django