# **Assignment-3**

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**Assignment : Write a program to find class and type of a given IP address.**

**#include <stdio.h>**

**#include <stdlib.h>**

**#include <string.h>**

**typedef struct {**

**unsigned char a, b, c, d;**

**} IPAddress;**

**int isPrivateIP(const IPAddress \*ip) {**

**if (ip->a == 10) return 1;**

**if (ip->a == 172 && (ip->b >= 16 && ip->b <= 31)) return 1;**

**if (ip->a == 192 && ip->b == 168) return 1;**

**return 0;**

**}**

**int isReservedIP(const IPAddress \*ip) {**

**if (ip->a == 0) return 1;**

**if (ip->a == 169 && ip->b == 254) return 1;**

**return 0;**

**}**

**int main() {**

**char ip\_string[20];**

**IPAddress ip;**

**printf("Enter an IP address (IPv4): ");**

**scanf("%19s", ip\_string);**

**// Parse IP address**

**if (sscanf(ip\_string, "%hhu.%hhu.%hhu.%hhu", &ip.a, &ip.b, &ip.c, &ip.d) != 4) {**

**printf("Invalid IP address format.\n");**

**return 1;**

**}**

**// Determine IP class**

**char ip\_class;**

**if (ip.a >= 1 && ip.a <= 126) {**

**ip\_class = 'A';**

**} else if (ip.a >= 128 && ip.a <= 191) {**

**ip\_class = 'B';**

**} else if (ip.a >= 192 && ip.a <= 223) {**

**ip\_class = 'C';**

**} else if (ip.a >= 224 && ip.a <= 239) {**

**ip\_class = 'D';**

**} else if (ip.a >= 240 && ip.a <= 255) {**

**ip\_class = 'E';**

**} else {**

**printf("Invalid IP address.\n");**

**return 1;**

**}**

**// Determine the type (Private, Reserved, or Public)**

**if (isPrivateIP(&ip)) {**

**printf("IP Class: %c\nType: Private\n", ip\_class);**

**} else if (isReservedIP(&ip)) {**

**printf("IP Class: %c\nType: Reserved\n", ip\_class);**

**} else {**

**printf("IP Class: %c\nType: Public\n", ip\_class);**

**}**

**return 0;**

**}**

**Output :-**

