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Network and Communication CSE-1004

Digital Assignment LAB- 3

Faculty – Dr. Asis Kumar Tripathy

Question

Q1. For any class B ip address, go for 16 subnets.

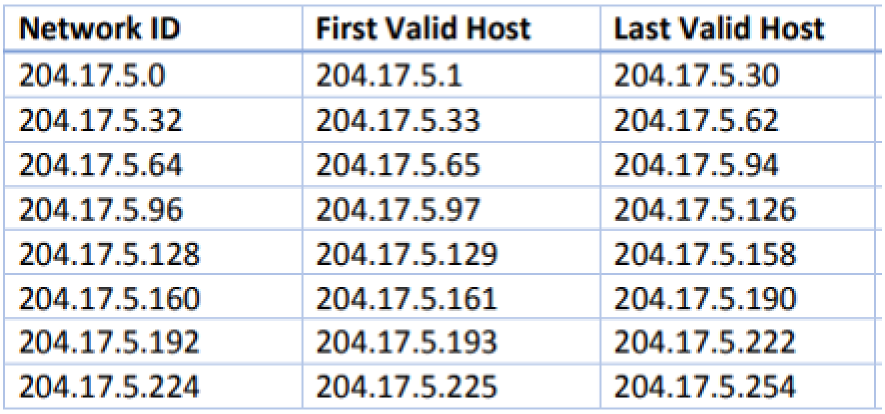
For example, given a Class B network of 130.17.5.0 which has a natural mask of 255.255.0.0, you can create subnets in this manner:

Input: Take any class C ip address

Processing: Create 8 subnets and find the network address, first valid and last valid ip address in each subnet

Output: As shown below.

The below table is an example of a Class C ip address but your answer will not match it. It is just given for your reference.



Network ID	First Valid Host	Last Valid Host
204.17.5.0	204.17.5.1	204.17.5.30
204.17.5.32	204.17.5.33	204.17.5.62
204.17.5.64	204.17.5.65	204.17.5.94
204.17.5.96	204.17.5.97	204.17.5.126
204.17.5.128	204.17.5.129	204.17.5.158
204.17.5.160	204.17.5.161	204.17.5.190
204.17.5.192	204.17.5.193	204.17.5.222
204.17.5.224	204.17.5.225	204.17.5.254

Answer:

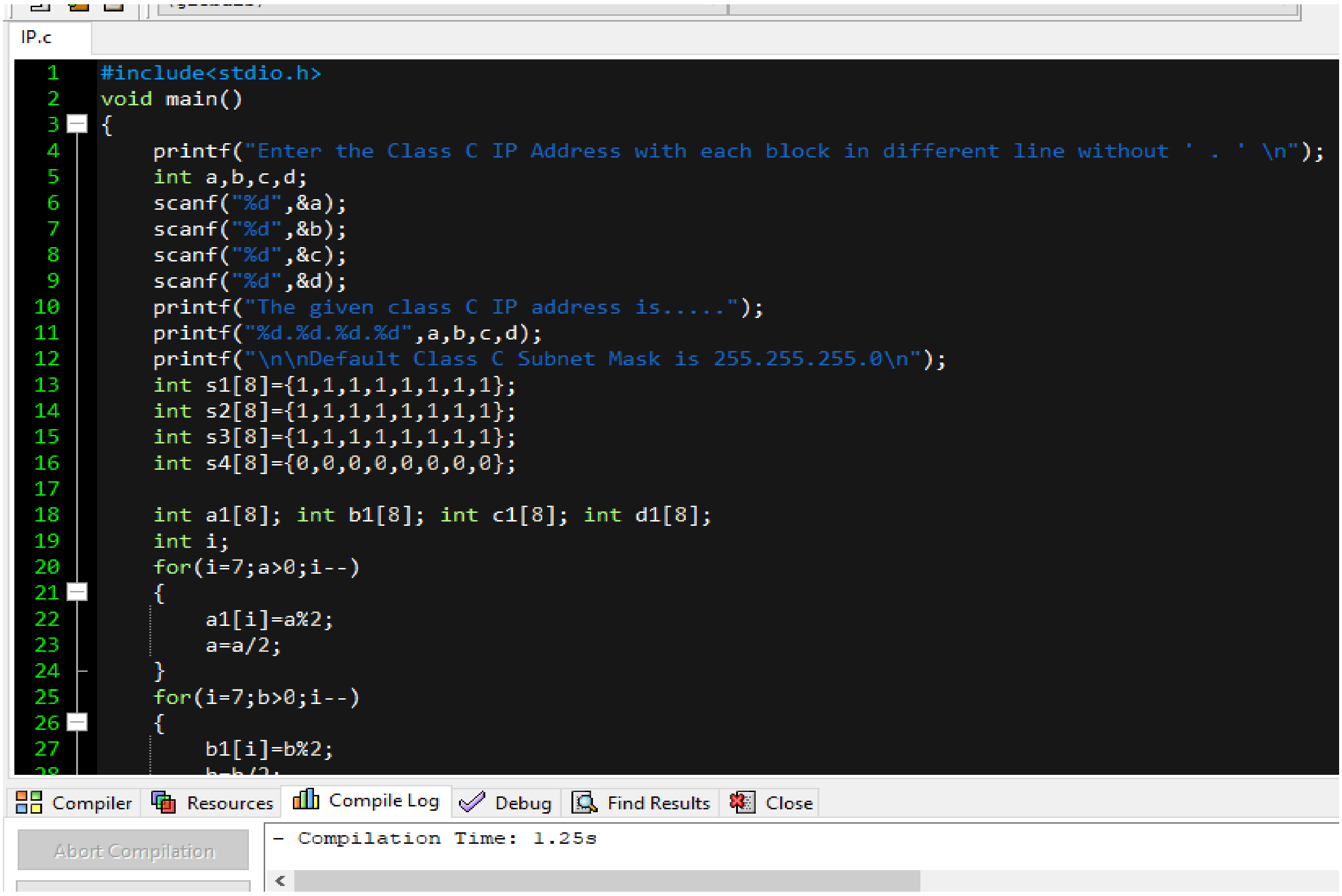
Code:

```
#include<stdio.h>

void main()

{

        printf("Enter the Class C IP Address with each block in different line without ' . ' \n");

        int a,b,c,d;

        scanf("%d",&a);
```

```
    scanf("%d",&b);
    scanf("%d",&c);
    scanf("%d",&d);
    printf("The given class C IP address is.....");
    printf("%d.%d.%d.%d",a,b,c,d);
    printf("\n\nDefault Class C Subnet Mask is 255.255.255.0\n");
    int s1[8]={1,1,1,1,1,1,1,1};
    int s2[8]={1,1,1,1,1,1,1,1};
    int s3[8]={1,1,1,1,1,1,1,1};
    int s4[8]={0,0,0,0,0,0,0,0};

int a1[8]; int b1[8]; int c1[8]; int d1[8];
int i;
for(i=7;a>0;i--)
    {
          a1[i]=a%2;
          a=a/2;
    }
    for(i=7;b>0;i--)
    {
          b1[i]=b%2;
          b=b/2;
    }
    for(i=7;c>0;i--)
    {
          c1[i]=c%2;
          c=c/2;
    }
    for(i=7;d>0;i--)
    {
          d1[i]=d%2;
          d=d/2;
    }
```

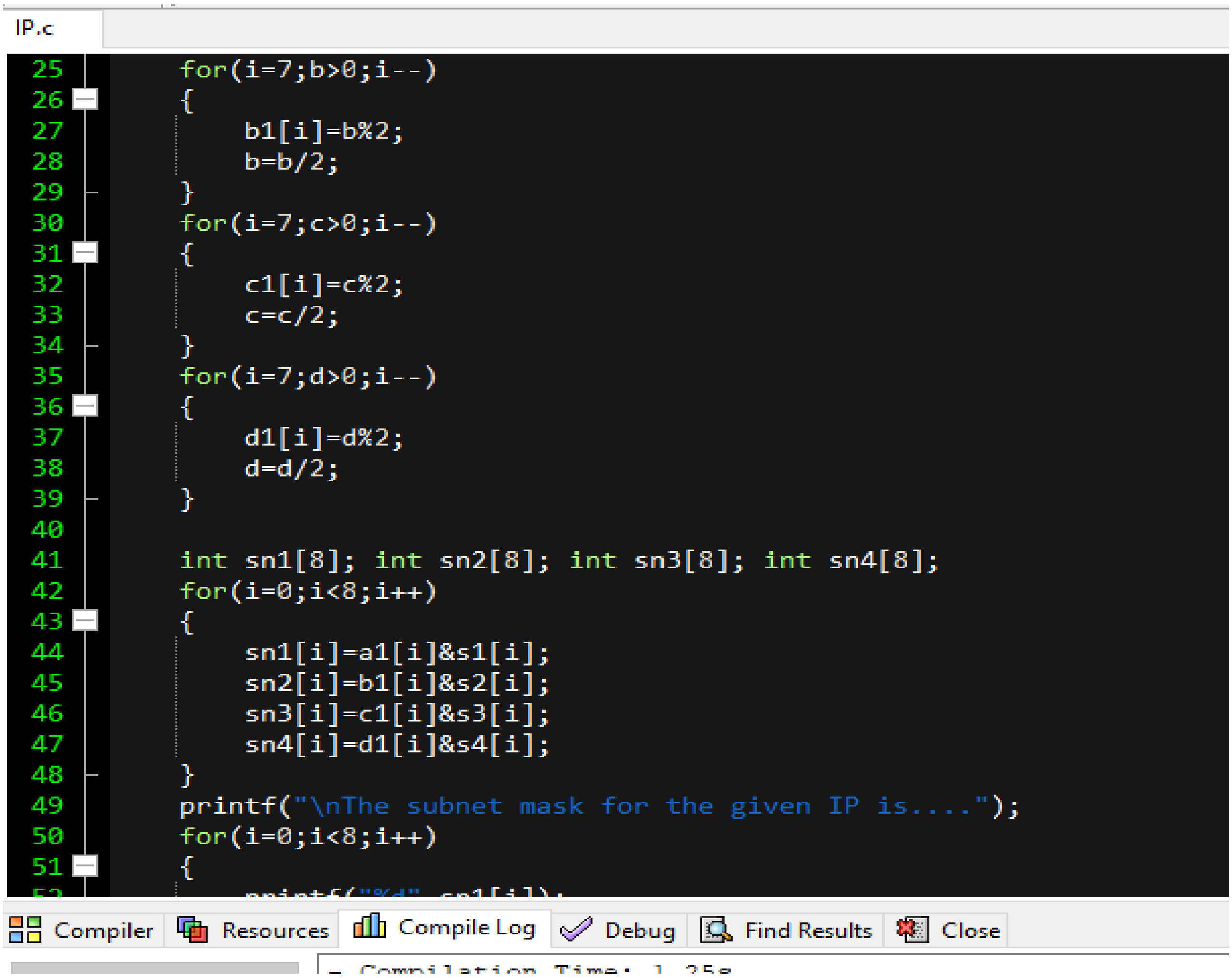
```
        int sn1[8]; int sn2[8]; int sn3[8]; int sn4[8];
        for(i=0;i<8;i++)
        {
                sn1[i]=a1[i]&s1[i];
                sn2[i]=b1[i]&s2[i];
                sn3[i]=c1[i]&s3[i];
                sn4[i]=d1[i]&s4[i];
        }
        printf("\nThe subnet mask for the given IP is....");
        for(i=0;i<8;i++)
        {
                printf("%d",sn1[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",sn2[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",sn3[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",sn4[i]);
        }
        printf("\nThe Subnet Mask in decimal format is = ");
        int dn1,dn2,dn3,dn4;
        int base = 1;
        for(i=7;i>=0;i--)
    {
      dn1 = dn1 + sn1[i]* base;
    base = base * 2;
}
printf("%d.",dn1);
base = 1;
        for(i=7;i>=0;i--)
{
    dn2 = dn2 + sn2[i]* base;
    base = base * 2;
}
printf("%d.",dn2);
base = 1;
        for(i=7;i>=0;i--)
{
    dn3 = dn3 + sn3[i]* base;
    base = base * 2;
}
printf("%d.",dn3);
base = 1;
        for(i=7;i>=0;i--)
{
    dn4 = dn4 + sn4[i]* base;
    base = base * 2;
}
printf("%d",dn4);

printf("\n\nThe Network ID in binary format is....");

int n1[8]; int n2[8]; int n3[8]; int n4[8];
        for(i=0;i<8;i++)
        {
                    n1[i]=a1[i]&sn1[i];
                    n2[i]=b1[i]&sn2[i];
                    n3[i]=c1[i]&sn3[i];
                    n4[i]=d1[i]&sn4[i];
        }
        for(i=0;i<8;i++)
        {
                printf("%d",n1[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",n2[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",n3[i]);
        }
        printf(".");
        for(i=0;i<8;i++)
        {
                printf("%d",n4[i]);
        }
        printf("\nThe Network ID in decimal format is = ");
dn1=0;dn2=0;dn3=0;dn4=0;
base=1;
        for(i=7;i>=0;i--)
{
    dn1 = dn1 + n1[i]* base;
    base = base * 2;
}
printf("%d.",dn1);
base = 1;
        for(i=7;i>=0;i--)
{
    dn2 = dn2 + n2[i]* base;
    base = base * 2;
    }
    printf("%d.",dn2);
    base = 1;
            for(i=7;i>=0;i--)
    {
        dn3 = dn3 + n3[i]* base;
        base = base * 2;
    }
    printf("%d.",dn3);
    base = 1;
            for(i=7;i>=0;i--)
    {
        dn4 = dn4 + n4[i]* base;
        base = base * 2;
    }
    printf("%d",dn4);

    printf("\n\nNetwork ID                  First Valid ID             Last Valid ID\n");
    int cn=0;
    for(i=0;i<8;i++)
    {
            printf("\n%d.%d.%d.%d                     %d.%d.%d.%d
            %d.%d.%d.%d",dn1,dn2,dn3,(dn4+cn),dn1,dn2,dn3,(dn4+1+cn),dn1,dn2,dn3,(dn4+30+cn));
            cn=cn+32;
    }
}
```

Snapshots of Code:



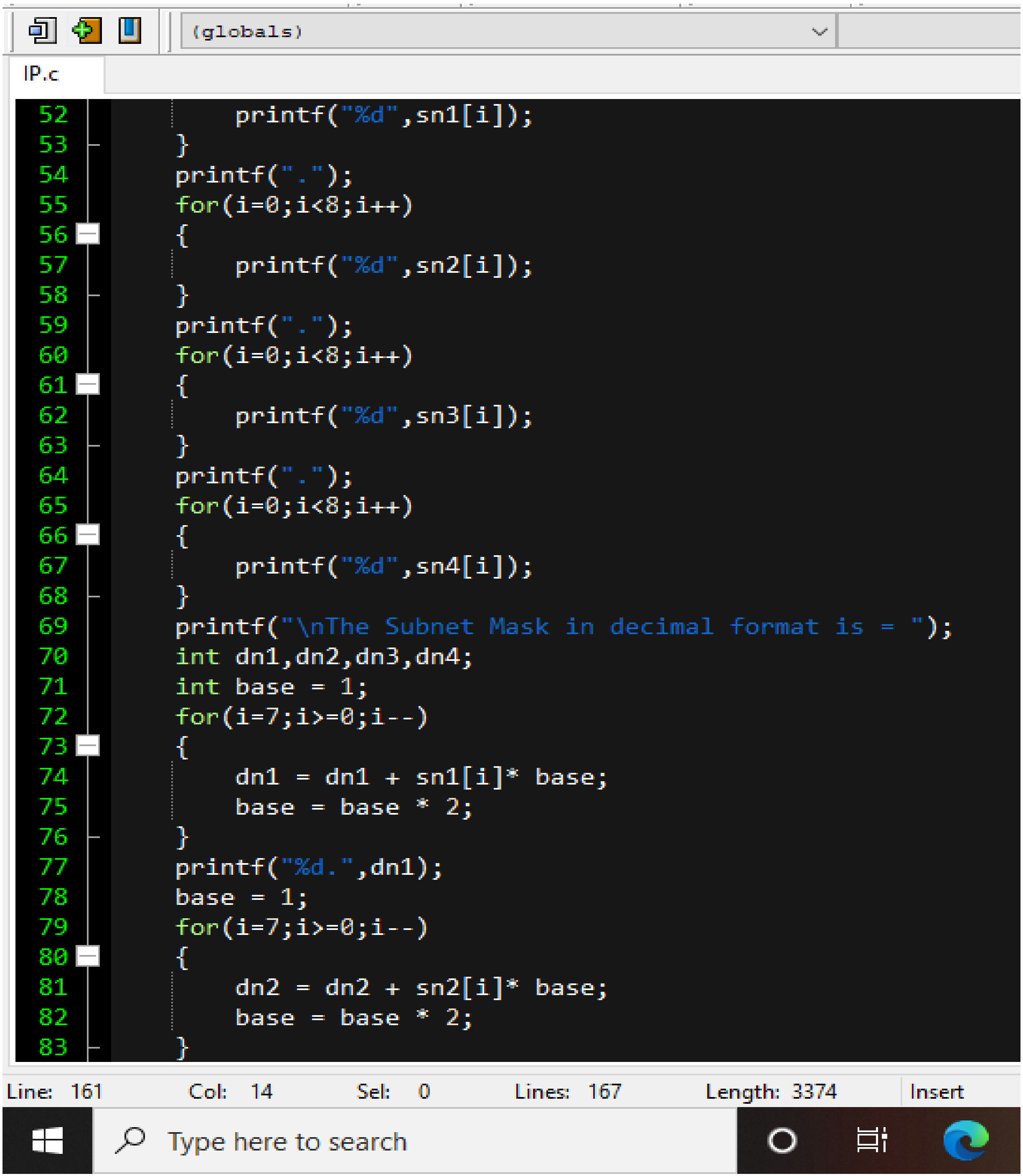
```c
#include<stdio.h>
void main()
{
    printf("Enter the Class C IP Address with each block in different line without ' . ' \n");
    int a,b,c,d;
    scanf("%d",&a);
    scanf("%d",&b);
    scanf("%d",&c);
    scanf("%d",&d);
    printf("The given class C IP address is.....");
    printf("%d.%d.%d.%d",a,b,c,d);
    printf("\n\nDefault Class C Subnet Mask is 255.255.255.0\n");
    int s1[8]={1,1,1,1,1,1,1,1};
    int s2[8]={1,1,1,1,1,1,1,1};
    int s3[8]={1,1,1,1,1,1,1,1};
    int s4[8]={0,0,0,0,0,0,0,0};

    int a1[8]; int b1[8]; int c1[8]; int d1[8];
    int i;
    for(i=7;a>0;i--)
    {
        a1[i]=a%2;
        a=a/2;
    }
    for(i=7;b>0;i--)
    {
        b1[i]=b%2;
        b=b/2;
```

```
- Compilation Time: 1.25s
```



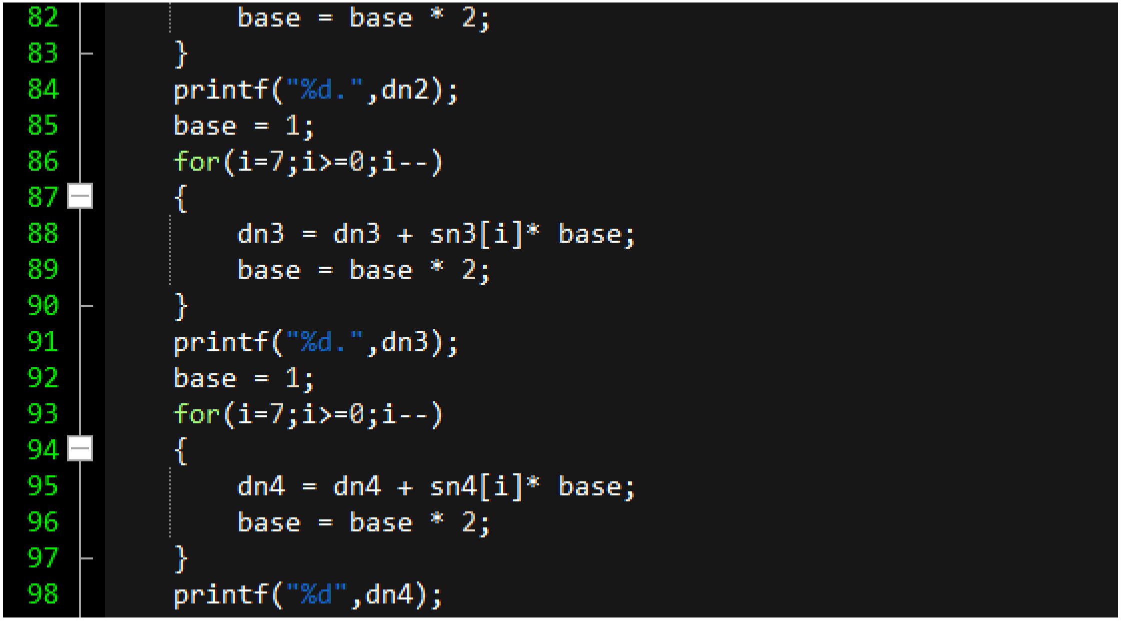
```c
    for(i=7;b>0;i--)
    {
        b1[i]=b%2;
        b=b/2;
    }
    for(i=7;c>0;i--)
    {
        c1[i]=c%2;
        c=c/2;
    }
    for(i=7;d>0;i--)
    {
        d1[i]=d%2;
        d=d/2;
    }

    int sn1[8]; int sn2[8]; int sn3[8]; int sn4[8];
    for(i=0;i<8;i++)
    {
        sn1[i]=a1[i]&s1[i];
        sn2[i]=b1[i]&s2[i];
        sn3[i]=c1[i]&s3[i];
        sn4[i]=d1[i]&s4[i];
    }
    printf("\nThe subnet mask for the given IP is....");
    for(i=0;i<8;i++)
    {
        printf("%d",sn1[i]);
```

```
- Compilation Time: 1.25s
```

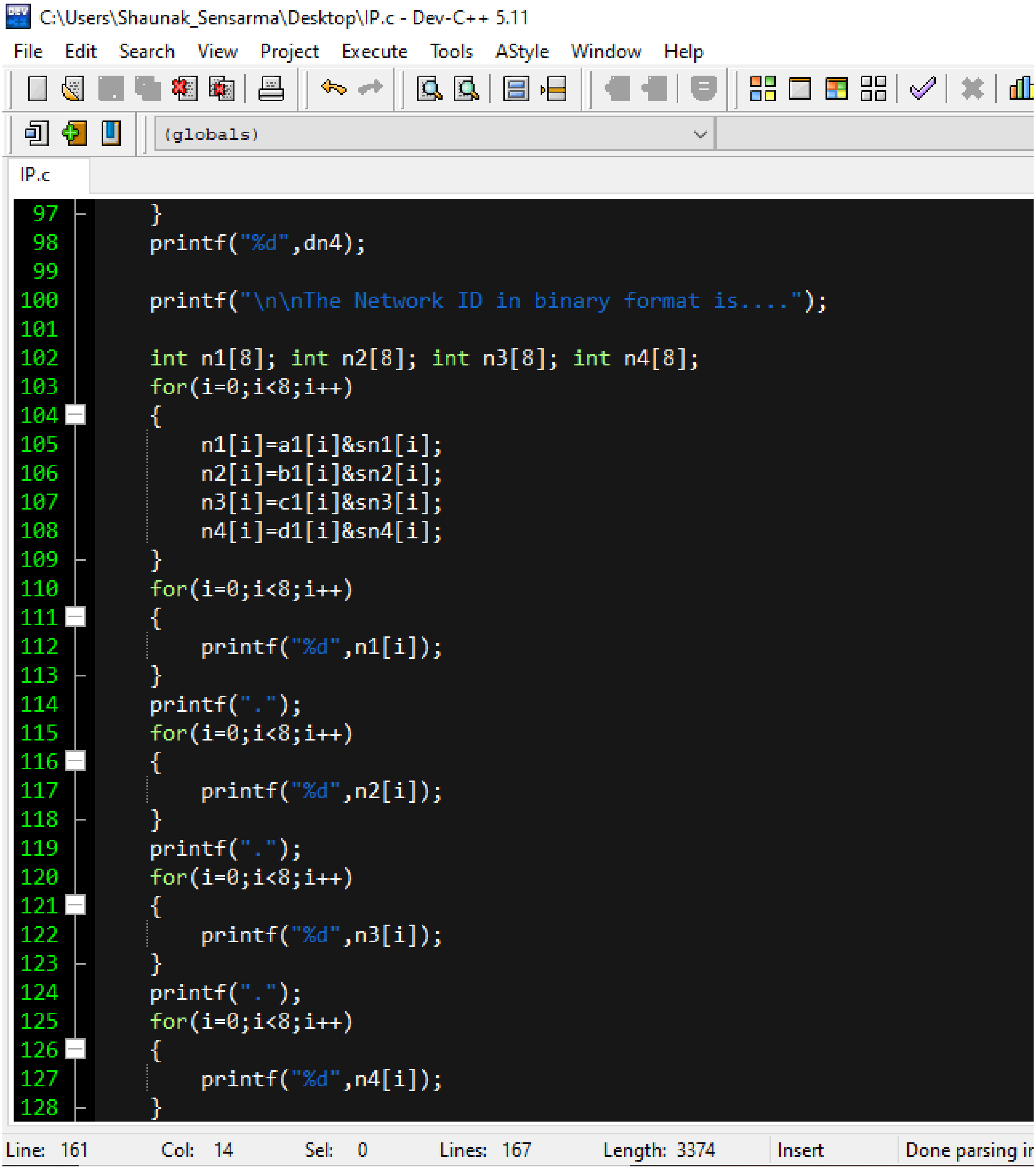


```
        printf("%d",sn1[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",sn2[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",sn3[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",sn4[i]);
    }
    printf("\nThe Subnet Mask in decimal format is = ");
    int dn1,dn2,dn3,dn4;
    int base = 1;
    for(i=7;i>=0;i--)
    {
        dn1 = dn1 + sn1[i]* base;
        base = base * 2;
    }
    printf("%d.",dn1);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn2 = dn2 + sn2[i]* base;
        base = base * 2;
    }
```

Line: 161 Col: 14 Sel: 0 Lines: 167 Length: 3374 Insert

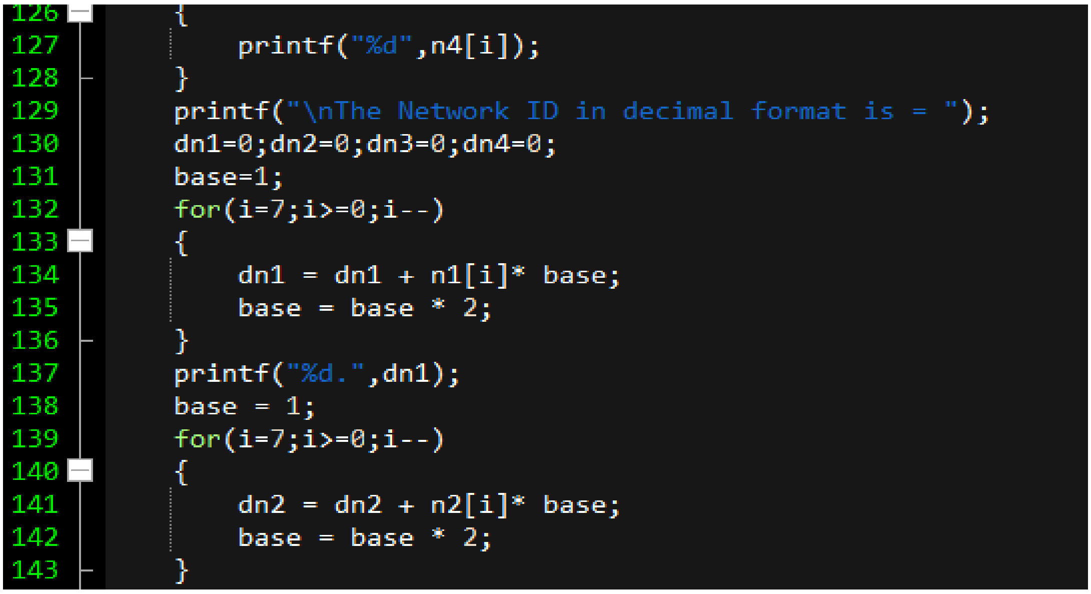


```
        base = base * 2;
    }
    printf("%d.",dn2);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn3 = dn3 + sn3[i]* base;
        base = base * 2;
    }
    printf("%d.",dn3);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn4 = dn4 + sn4[i]* base;
        base = base * 2;
    }
    printf("%d",dn4);
```

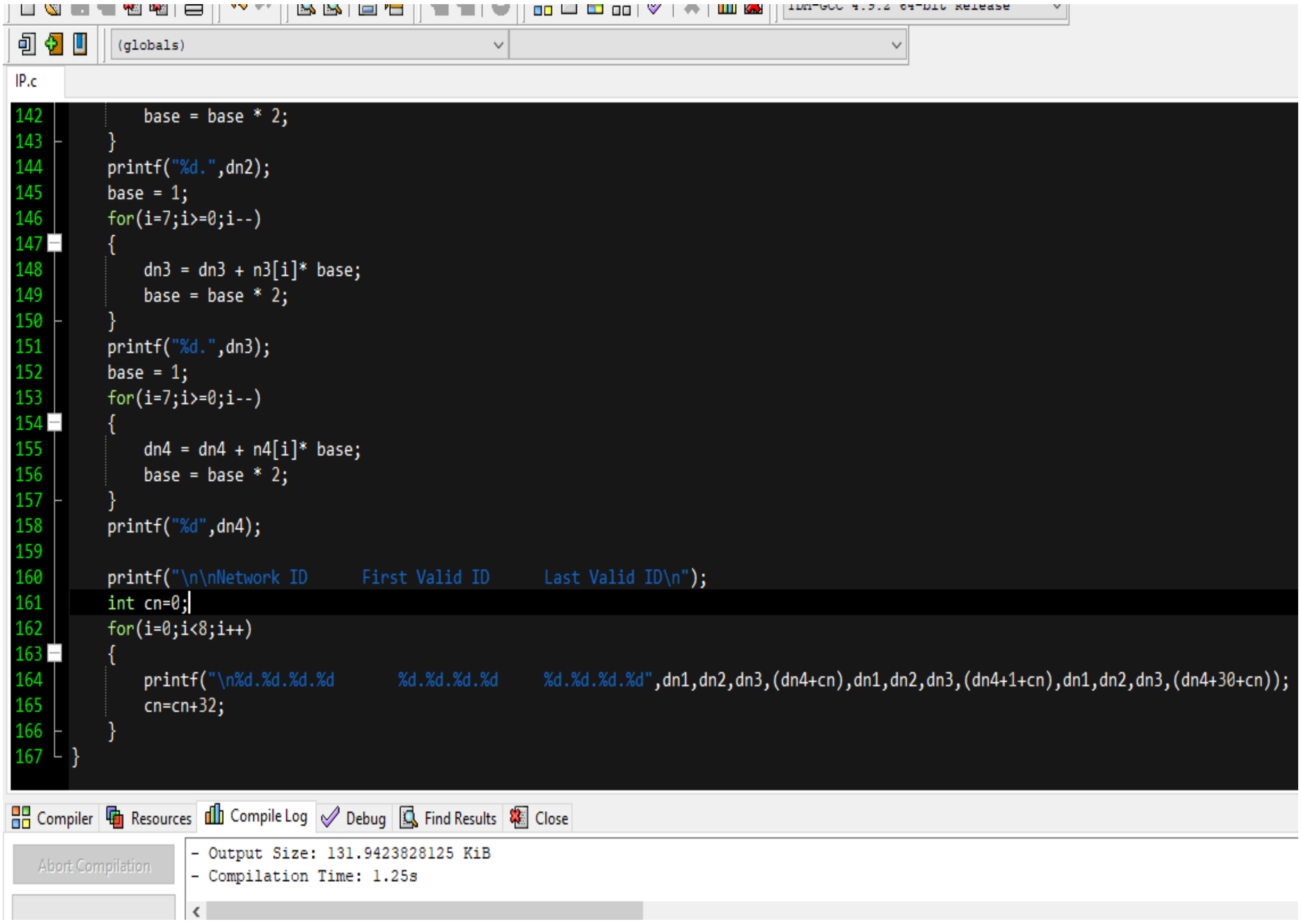

C:\Users\Shaunak_Sensarma\Desktop\IP.c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
IP.c

```c
    }
    printf("%d",dn4);

    printf("\n\nThe Network ID in binary format is....");

    int n1[8]; int n2[8]; int n3[8]; int n4[8];
    for(i=0;i<8;i++)
    {
        n1[i]=a1[i]&sn1[i];
        n2[i]=b1[i]&sn2[i];
        n3[i]=c1[i]&sn3[i];
        n4[i]=d1[i]&sn4[i];
    }
    for(i=0;i<8;i++)
    {
        printf("%d",n1[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",n2[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",n3[i]);
    }
    printf(".");
    for(i=0;i<8;i++)
    {
        printf("%d",n4[i]);
    }
```

Line: 161 Col: 14 Sel: 0 Lines: 167 Length: 3374 Insert Done parsing ir



```c
    {
        printf("%d",n4[i]);
    }
    printf("\nThe Network ID in decimal format is = ");
    dn1=0;dn2=0;dn3=0;dn4=0;
    base=1;
    for(i=7;i>=0;i--)
    {
        dn1 = dn1 + n1[i]* base;
        base = base * 2;
    }
    printf("%d.",dn1);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn2 = dn2 + n2[i]* base;
        base = base * 2;
    }
```

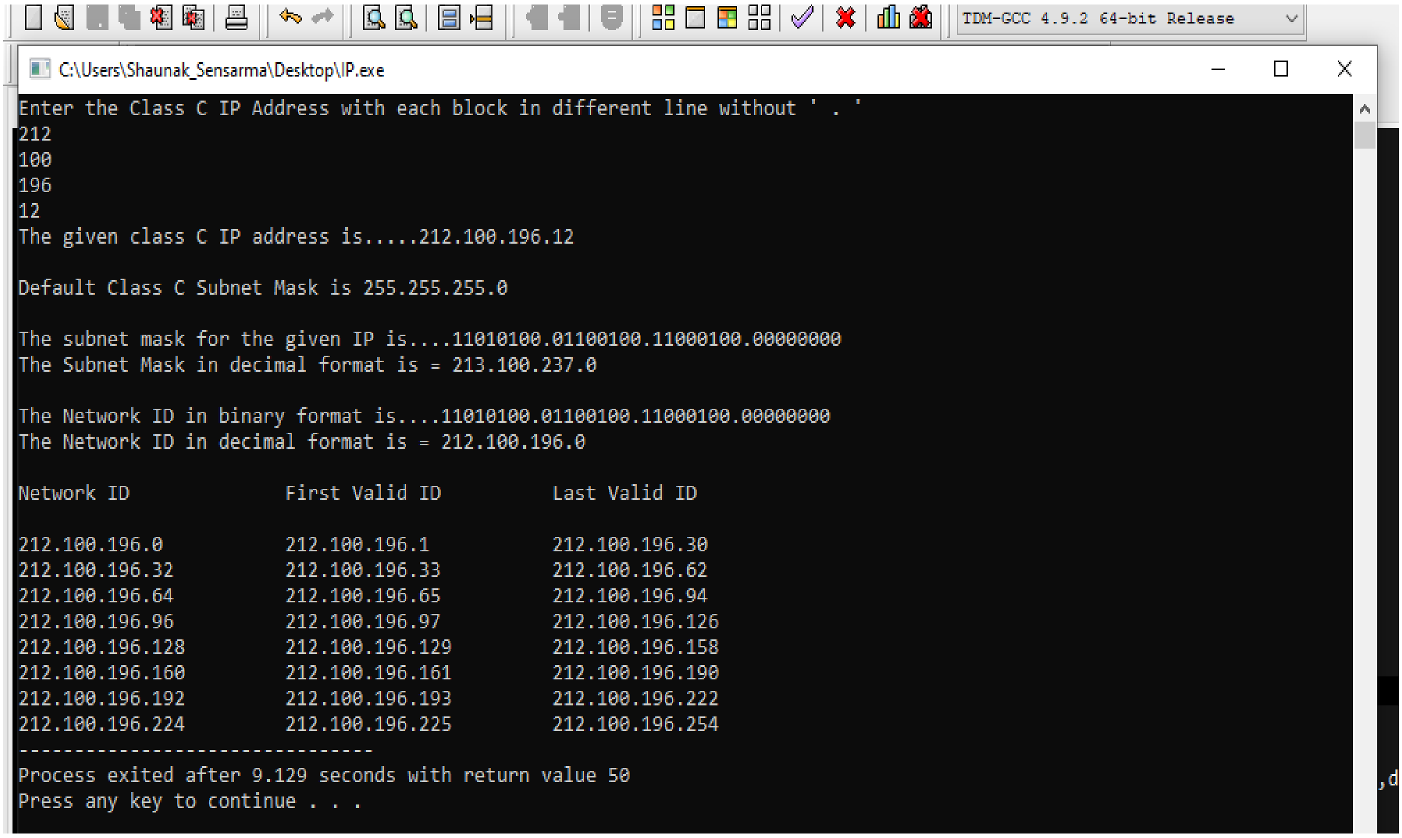


```c
        base = base * 2;
    }
    printf("%d.",dn2);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn3 = dn3 + n3[i]* base;
        base = base * 2;
    }
    printf("%d.",dn3);
    base = 1;
    for(i=7;i>=0;i--)
    {
        dn4 = dn4 + n4[i]* base;
        base = base * 2;
    }
    printf("%d",dn4);

    printf("\n\nNetwork ID      First Valid ID      Last Valid ID\n");
    int cn=0;
    for(i=0;i<8;i++)
    {
        printf("\n%d.%d.%d.%d       %d.%d.%d.%d      %d.%d.%d.%d",dn1,dn2,dn3,(dn4+cn),dn1,dn2,dn3,(dn4+1+cn),dn1,dn2,dn3,(dn4+30+cn));
        cn=cn+32;
    }
}
```

```
- Output Size: 131.9423828125 KiB
- Compilation Time: 1.25s
```

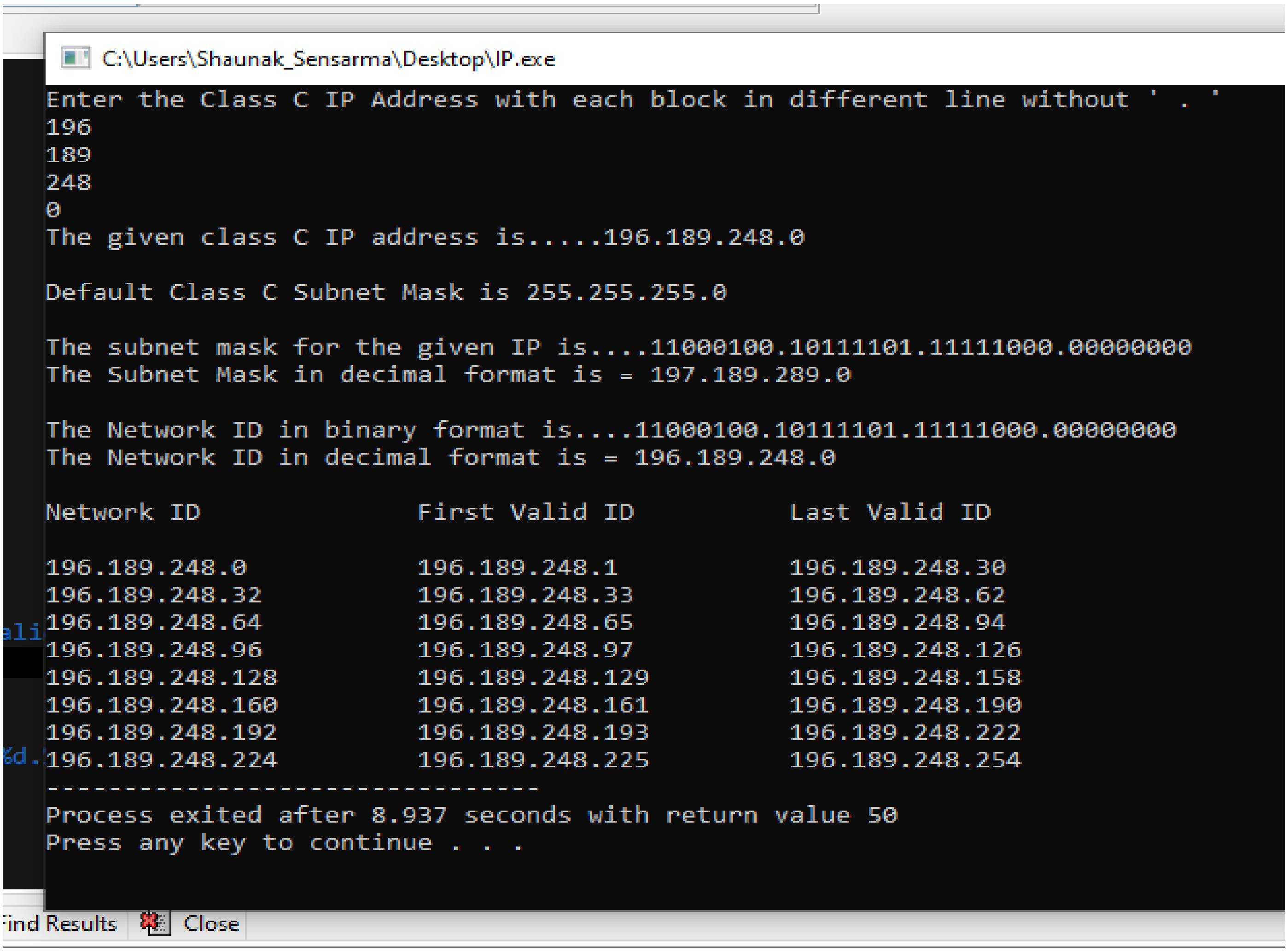
Snapshots of Output:

Output-1:


TDM-GCC 4.9.2 64-bit Release
C:\Users\Shaunak_Sensarma\Desktop\IP.exe

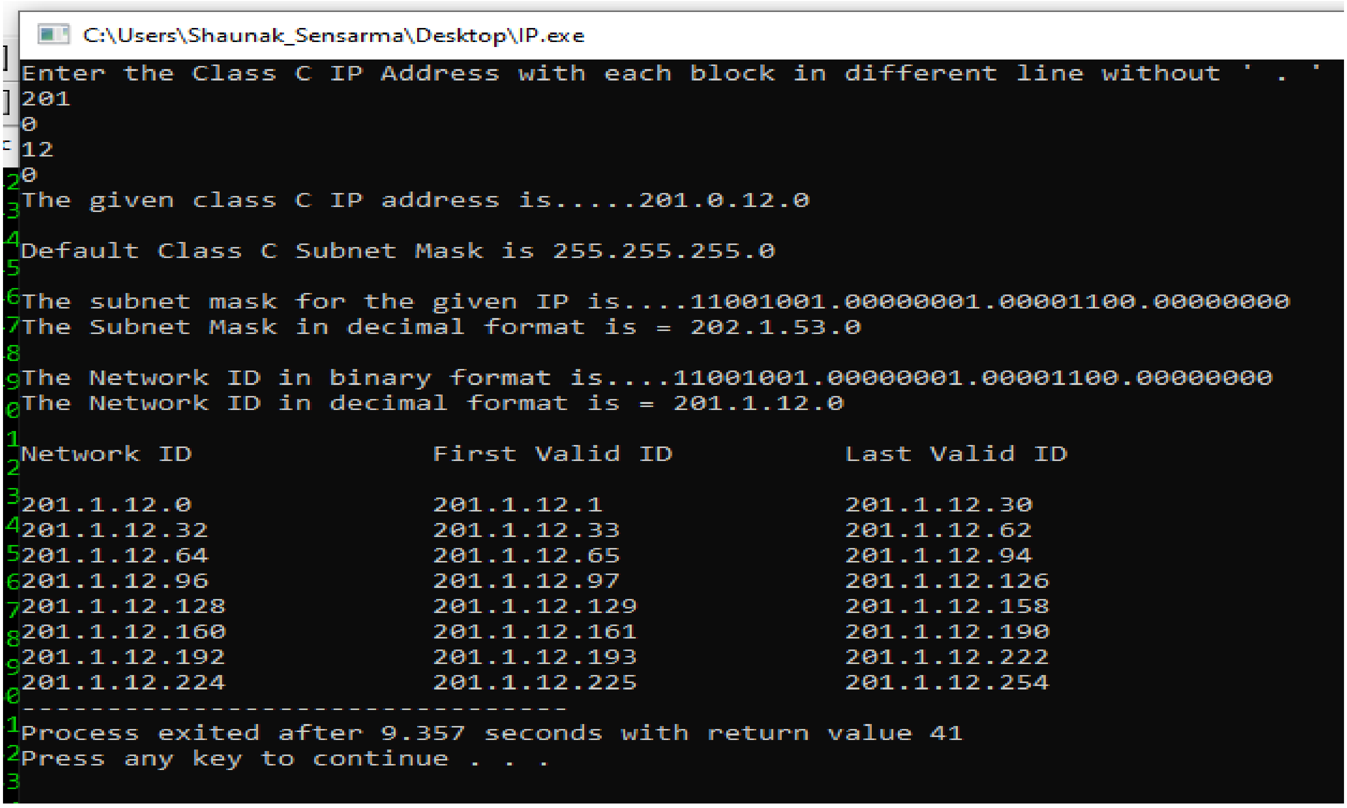
```
Enter the Class C IP Address with each block in different line without ' . '
212
100
196
12
The given class C IP address is.....212.100.196.12

Default Class C Subnet Mask is 255.255.255.0

The subnet mask for the given IP is....11010100.01100100.11000100.00000000
The Subnet Mask in decimal format is = 213.100.237.0

The Network ID in binary format is....11010100.01100100.11000100.00000000
The Network ID in decimal format is = 212.100.196.0

Network ID              First Valid ID          Last Valid ID

212.100.196.0           212.100.196.1           212.100.196.30
212.100.196.32          212.100.196.33          212.100.196.62
212.100.196.64          212.100.196.65          212.100.196.94
212.100.196.96          212.100.196.97          212.100.196.126
212.100.196.128         212.100.196.129         212.100.196.158
212.100.196.160         212.100.196.161         212.100.196.190
212.100.196.192         212.100.196.193         212.100.196.222
212.100.196.224         212.100.196.225         212.100.196.254
--------------------------------
Process exited after 9.129 seconds with return value 50
Press any key to continue . . .
```

Output- 2:



```
Enter the Class C IP Address with each block in different line without ' . '
196
189
248
0
The given class C IP address is.....196.189.248.0

Default Class C Subnet Mask is 255.255.255.0

The subnet mask for the given IP is....11000100.10111101.11111000.00000000
The Subnet Mask in decimal format is = 197.189.289.0

The Network ID in binary format is....11000100.10111101.11111000.00000000
The Network ID in decimal format is = 196.189.248.0

Network ID               First Valid ID           Last Valid ID

196.189.248.0            196.189.248.1            196.189.248.30
196.189.248.32           196.189.248.33           196.189.248.62
196.189.248.64           196.189.248.65           196.189.248.94
196.189.248.96           196.189.248.97           196.189.248.126
196.189.248.128          196.189.248.129          196.189.248.158
196.189.248.160          196.189.248.161          196.189.248.190
196.189.248.192          196.189.248.193          196.189.248.222
196.189.248.224          196.189.248.225          196.189.248.254
--------------------------------
Process exited after 8.937 seconds with return value 50
Press any key to continue . . .
```

Output3:



```
Enter the Class C IP Address with each block in different line without ' . '
201
0
12
0
The given class C IP address is.....201.0.12.0

Default Class C Subnet Mask is 255.255.255.0

The subnet mask for the given IP is....11001001.00000001.00001100.00000000
The Subnet Mask in decimal format is = 202.1.53.0

The Network ID in binary format is....11001001.00000001.00001100.00000000
The Network ID in decimal format is = 201.1.12.0

Network ID               First Valid ID           Last Valid ID

201.1.12.0               201.1.12.1               201.1.12.30
201.1.12.32              201.1.12.33              201.1.12.62
201.1.12.64              201.1.12.65              201.1.12.94
201.1.12.96              201.1.12.97              201.1.12.126
201.1.12.128             201.1.12.129             201.1.12.158
201.1.12.160             201.1.12.161             201.1.12.190
201.1.12.192             201.1.12.193             201.1.12.222
201.1.12.224             201.1.12.225             201.1.12.254
--------------------------------
Process exited after 9.357 seconds with return value 41
Press any key to continue . . .
```