**NAME : SUBHANKAR GHOSH YEAR: 3RD SEM : 6TH ROLL NO.: 32**

**ASSIGNMENT 2(a)**

**SOURCE CODE :-**

**import math**

**import itertools**

**import textwrap**

**ip=input("Enter the IP ADDRESS : ")**

**n\_subnet=int(input("Enter the number of subnets : "))**

**fixed\_bits=int(math.ceil(math.log(n\_subnet)/math.log(2)))**

**ip\_split=ip.split('.')**

**ip\_split\_class=int(ip\_split[0])**

**bin\_ip\_split=[]**

**for i in ip\_split:**

**bin\_ip\_split.append(format(int(i),'08b'))**

**bin\_ip=''.join(bin\_ip\_split)**

**combinations=list(map(list, itertools.product([0, 1], repeat=fixed\_bits)))**

**def Nclass(a,bin\_ip,fixed\_bits,combinations,out,b):**

**lhs=bin\_ip[:a]**

**rhs='0'\*(32-fixed\_bits-a)**

**out.write(f'Class {b}\n')**

**for i,c in enumerate(combinations,1):**

**val=lhs+''.join(map(str,c))+rhs**

**seg\_ip=textwrap.wrap(val,8)**

**req\_ip='.'.join(seg\_ip)**

**val\_split=req\_ip.split('.')**

**val\_ip\_split=[]**

**for j in val\_split:**

**val\_ip\_split.append(int(j,2))**

**val\_ip='.'.join(map(str,val\_ip\_split))**

**out.write(f'Subnet {i} ID : {val\_ip}\n')**

**def subnet\_mask(a,fixed\_bits,out,b):**

**s\_lhs='1'\*a**

**fixed='1'\*fixed\_bits**

**s\_rhs='0'\*(32-fixed\_bits-a)**

**mask=s\_lhs+fixed+s\_rhs**

**seg\_mask\_ip=textwrap.wrap(mask,8)**

**req\_mask\_ip='.'.join(seg\_mask\_ip)**

**mask\_split=req\_mask\_ip.split('.')**

**mask\_ip\_split=[]**

**for i in mask\_split:**

**mask\_ip\_split.append(int(i,2))**

**mask\_ip='.'.join(map(str,mask\_ip\_split))**

**out.write(f'Subnet Mask : {mask\_ip}\n')**

**out=open("Output4.txt",'w')**

**if ip\_split\_class>=1 and ip\_split\_class<=126:**

**Nclass(8,bin\_ip,fixed\_bits,combinations,out,'A')**

**subnet\_mask(8,fixed\_bits,out,'A')**

**elif ip\_split\_class>=128 and ip\_split\_class<=191:**

**Nclass(16,bin\_ip,fixed\_bits,combinations,out,'B')**

**subnet\_mask(16,fixed\_bits,out,'B')**

**elif ip\_split\_class>=192 and ip\_split\_class<=223:**

**Nclass(24,bin\_ip,fixed\_bits,combinations,out,'C')**

**subnet\_mask(24,fixed\_bits,out,'C')**

**else:**

**print("Subnet Mask and Subnetworking are not possible in Class D and Class E network address")**

**out.close()**

**OUTPUT 1:-**

**Class A**

**Subnet 1 ID : 10.0.0.0**

**Subnet 2 ID : 10.8.0.0**

**Subnet 3 ID : 10.16.0.0**

**Subnet 4 ID : 10.24.0.0**

**Subnet 5 ID : 10.32.0.0**

**Subnet 6 ID : 10.40.0.0**

**Subnet 7 ID : 10.48.0.0**

**Subnet 8 ID : 10.56.0.0**

**Subnet 9 ID : 10.64.0.0**

**Subnet 10 ID : 10.72.0.0**

**Subnet 11 ID : 10.80.0.0**

**Subnet 12 ID : 10.88.0.0**

**Subnet 13 ID : 10.96.0.0**

**Subnet 14 ID : 10.104.0.0**

**Subnet 15 ID : 10.112.0.0**

**Subnet 16 ID : 10.120.0.0**

**Subnet 17 ID : 10.128.0.0**

**Subnet 18 ID : 10.136.0.0**

**Subnet 19 ID : 10.144.0.0**

**Subnet 20 ID : 10.152.0.0**

**Subnet 21 ID : 10.160.0.0**

**Subnet 22 ID : 10.168.0.0**

**Subnet 23 ID : 10.176.0.0**

**Subnet 24 ID : 10.184.0.0**

**Subnet 25 ID : 10.192.0.0**

**Subnet 26 ID : 10.200.0.0**

**Subnet 27 ID : 10.208.0.0**

**Subnet 28 ID : 10.216.0.0**

**Subnet 29 ID : 10.224.0.0**

**Subnet 30 ID : 10.232.0.0**

**Subnet 31 ID : 10.240.0.0**

**Subnet 32 ID : 10.248.0.0**

**Subnet Mask : 255.248.0.0**

**OUTPUT 2:-**

**Class B**

**Subnet 1 ID : 130.43.0.0**

**Subnet 2 ID : 130.43.16.0**

**Subnet 3 ID : 130.43.32.0**

**Subnet 4 ID : 130.43.48.0**

**Subnet 5 ID : 130.43.64.0**

**Subnet 6 ID : 130.43.80.0**

**Subnet 7 ID : 130.43.96.0**

**Subnet 8 ID : 130.43.112.0**

**Subnet 9 ID : 130.43.128.0**

**Subnet 10 ID : 130.43.144.0**

**Subnet 11 ID : 130.43.160.0**

**Subnet 12 ID : 130.43.176.0**

**Subnet 13 ID : 130.43.192.0**

**Subnet 14 ID : 130.43.208.0**

**Subnet 15 ID : 130.43.224.0**

**Subnet 16 ID : 130.43.240.0**

**Subnet Mask : 255.255.240.0**

**OUTPUT 3:-**

**Class C**

**Subnet 1 ID : 200.62.56.0**

**Subnet 2 ID : 200.62.56.4**

**Subnet 3 ID : 200.62.56.8**

**Subnet 4 ID : 200.62.56.12**

**Subnet 5 ID : 200.62.56.16**

**Subnet 6 ID : 200.62.56.20**

**Subnet 7 ID : 200.62.56.24**

**Subnet 8 ID : 200.62.56.28**

**Subnet 9 ID : 200.62.56.32**

**Subnet 10 ID : 200.62.56.36**

**Subnet 11 ID : 200.62.56.40**

**Subnet 12 ID : 200.62.56.44**

**Subnet 13 ID : 200.62.56.48**

**Subnet 14 ID : 200.62.56.52**

**Subnet 15 ID : 200.62.56.56**

**Subnet 16 ID : 200.62.56.60**

**Subnet 17 ID : 200.62.56.64**

**Subnet 18 ID : 200.62.56.68**

**Subnet 19 ID : 200.62.56.72**

**Subnet 20 ID : 200.62.56.76**

**Subnet 21 ID : 200.62.56.80**

**Subnet 22 ID : 200.62.56.84**

**Subnet 23 ID : 200.62.56.88**

**Subnet 24 ID : 200.62.56.92**

**Subnet 25 ID : 200.62.56.96**

**Subnet 26 ID : 200.62.56.100**

**Subnet 27 ID : 200.62.56.104**

**Subnet 28 ID : 200.62.56.108**

**Subnet 29 ID : 200.62.56.112**

**Subnet 30 ID : 200.62.56.116**

**Subnet 31 ID : 200.62.56.120**

**Subnet 32 ID : 200.62.56.124**

**Subnet 33 ID : 200.62.56.128**

**Subnet 34 ID : 200.62.56.132**

**Subnet 35 ID : 200.62.56.136**

**Subnet 36 ID : 200.62.56.140**

**Subnet 37 ID : 200.62.56.144**

**Subnet 38 ID : 200.62.56.148**

**Subnet 39 ID : 200.62.56.152**

**Subnet 40 ID : 200.62.56.156**

**Subnet 41 ID : 200.62.56.160**

**Subnet 42 ID : 200.62.56.164**

**Subnet 43 ID : 200.62.56.168**

**Subnet 44 ID : 200.62.56.172**

**Subnet 45 ID : 200.62.56.176**

**Subnet 46 ID : 200.62.56.180**

**Subnet 47 ID : 200.62.56.184**

**Subnet 48 ID : 200.62.56.188**

**Subnet 49 ID : 200.62.56.192**

**Subnet 50 ID : 200.62.56.196**

**Subnet 51 ID : 200.62.56.200**

**Subnet 52 ID : 200.62.56.204**

**Subnet 53 ID : 200.62.56.208**

**Subnet 54 ID : 200.62.56.212**

**Subnet 55 ID : 200.62.56.216**

**Subnet 56 ID : 200.62.56.220**

**Subnet 57 ID : 200.62.56.224**

**Subnet 58 ID : 200.62.56.228**

**Subnet 59 ID : 200.62.56.232**

**Subnet 60 ID : 200.62.56.236**

**Subnet 61 ID : 200.62.56.240**

**Subnet 62 ID : 200.62.56.244**

**Subnet 63 ID : 200.62.56.248**

**Subnet 64 ID : 200.62.56.252**

**Subnet Mask : 255.255.255.252**

**CMD OUTPUT:-**

**Enter the IP ADDRESS : 10.3.2.5**

**Enter the number of subnets : 17**

**runfile('D:/computer networks/ASSIGNMENT 2(a)/subnet\_musk.py', wdir='D:/computer networks/ASSIGNMENT 2(a)')**

**Enter the IP ADDRESS : 130.43.65.8**

**Enter the number of subnets : 9**

**runfile('D:/computer networks/ASSIGNMENT 2(a)/subnet\_musk.py', wdir='D:/computer networks/ASSIGNMENT 2(a)')**

**Enter the IP ADDRESS : 200.62.56.3**

**Enter the number of subnets : 33**

**runfile('D:/computer networks/ASSIGNMENT 2(a)/subnet\_musk.py', wdir='D:/computer networks/ASSIGNMENT 2(a)')**

**Enter the IP ADDRESS : 225.62.56.2**

**Enter the number of subnets : 12**

**Subnet Mask and Subnetworking are not possible in Class D and Class E network address**

**runfile('D:/computer networks/ASSIGNMENT 2(a)/subnet\_musk.py', wdir='D:/computer networks/ASSIGNMENT 2(a)')**

**Enter the IP ADDRESS : 241.53.5.7**

**Enter the number of subnets : 16**

**Subnet Mask and Subnetworking are not possible in Class D and Class E network address**