0 - 127 → Class A
128 - 191 → Class B
192 - 223 → Class C

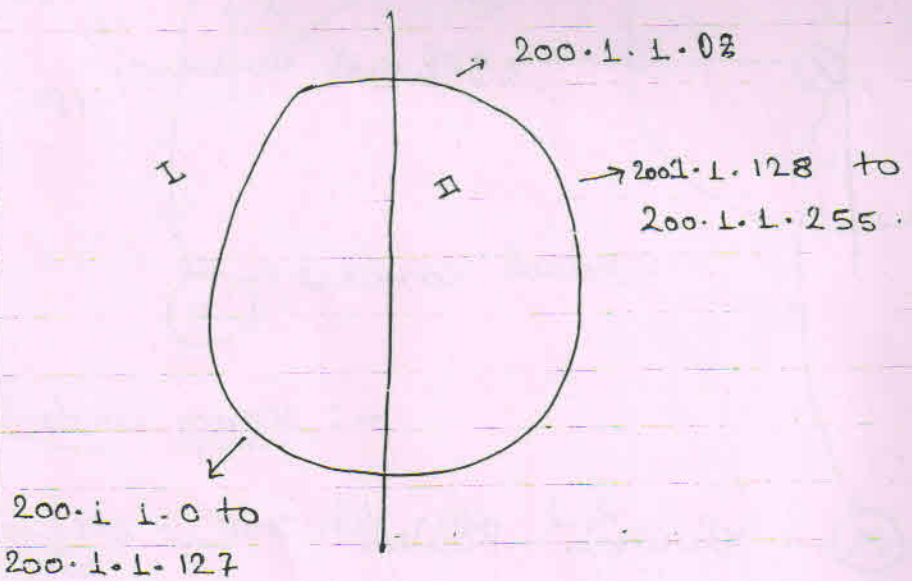
- Same bit 0 Host part mein, represent network Id and same bit one host part mein represent direct broadcast address.

Jab hamne Network ko further divide nahi kiya tha tab hamare pass 254 hosts possible hai.

But Jab do parts mein divide kiya toh
Pahale Subnet mein = 128 - 2 = 126 host
Second Subnet mein = 128 - 2 = 126 host

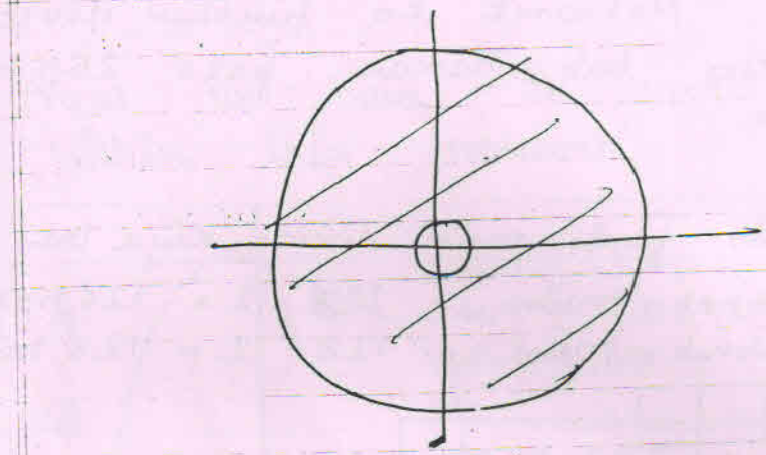
Total = 252 hosts

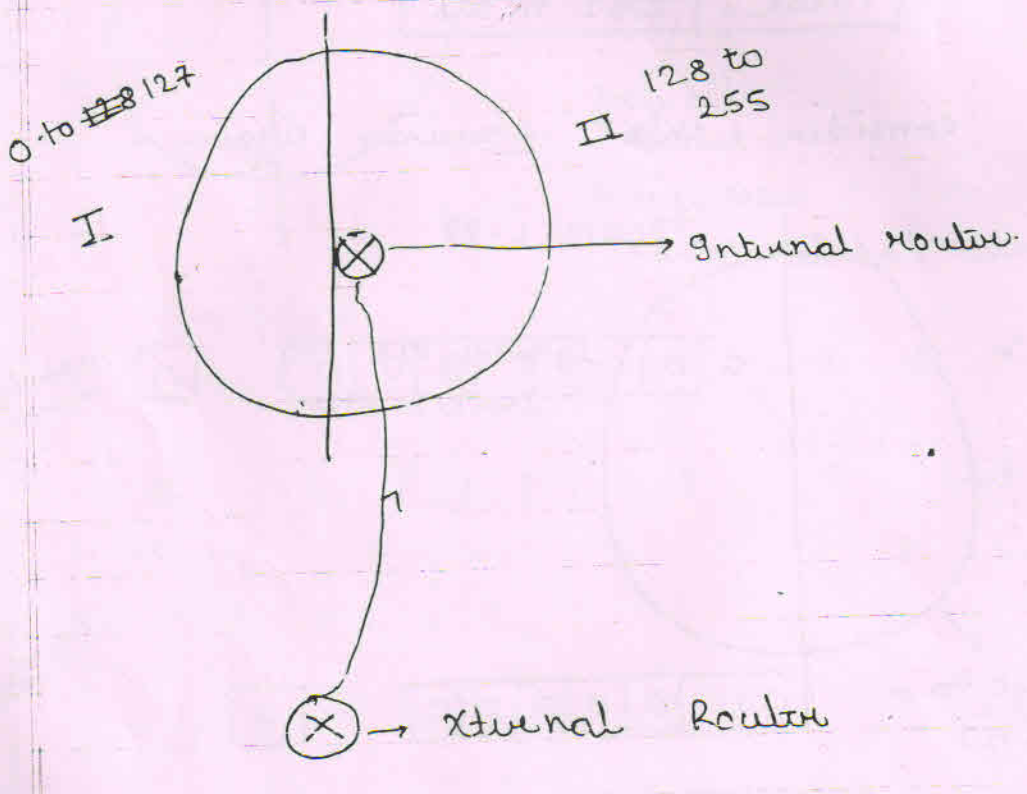
Now consider this scenario again -



- Yaha kuch problem dik rahai hai, ki pure network ka ID aur pahale Subnet ka ID same hai aur pure network ka broadcast Id aur II Subnet ka broadcast id same hai. Yaha confusion hoga.

- Now is confusion ko kaise ~~th~~ handle kiya jaye.



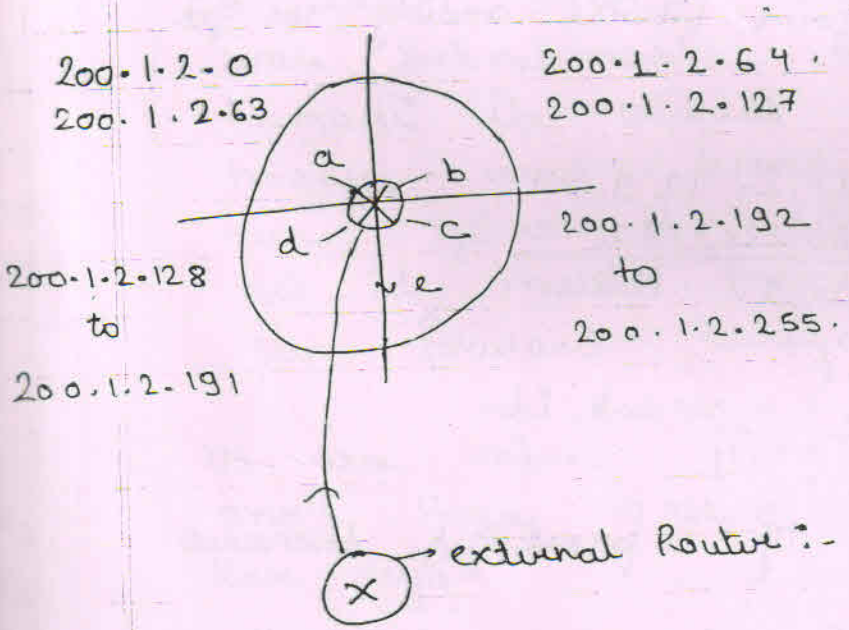


Agar bahar se koi bhi address aata hai '200.1.1.255 toh internal router pure network mein woh information broadcast karega.

Because bahar wale ko yeh nahi pata hai ki given network aur bhi networks mein divide hai.

- Aur agar I department yeh address generate karta hai 200.1.1.255 toh woh II department mein broadcast karega na ki pure network mein.

Now consider following scenario.



Subnet mask :-

Subnet id + net-id all 1's

Host-id all 0's.

Example: 255.255.255.0 → Class C subnet mask.

Here Subnet mask is 255.255.255.11000000
255.255.255.192

- With the help of subnet mask we can find out network id from the given IP address.

Example:-

Qus:- Given if address 200.1.2.129 and Subnetmask id ~~200.1.2.192~~ 255.255.255.192 then find network id ??

Ans:-

Simply ~~or~~ perform bitwise anding we get network id.

$$\begin{array}{r} 200.1.2.129 \\ (\&)\ \text{Anding}\quad \underline{255.255.255.192} \\ 200.1.2.128 \end{array}$$

(net id) → Network id.

Routing Table of previous scenario

NID	Subnet mask	Interface
200.1.2.0	255.255.255.192	a
200.1.2.64	255.255.255.192	b
200.1.2.128	255.255.255.192	c
200.1.2.192	255.255.255.192	d
0.0.0.0	0.0.0.0	e

- Agar kohi address aata hai toh woh sabse pahale routing table se concern karega usme subnet mask se subnet mask aur given ip address ki anding karega then net id match hoga toh us interface par forward karega, aur agar kisi se bhi nahi hua toh 0.0.0.0 se ho ki jayega toh us packet ko woh waha forward karega

- In case agar hamare hamne pahale wale subnet mask se ending karwayi hamari ip address aur net-id match hogaya now second subnet mask liya aur given ip-address aur usse bhi net-id match hogaya toh konse interface par forward karega.

- Us case mein jiske subnet id mein jada one's hogy us interface par forward kar diga.

Now yeh joh hamne discuss kiya tha woh fixed length subnet problem thi, yahi sabhi subnet ki size same the.

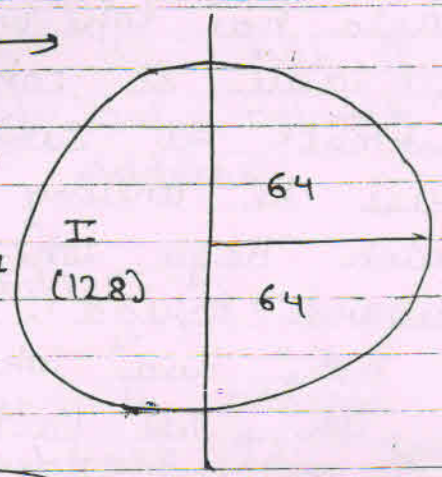
- Now aab hum discuss karenge hai variable length subnet ~~ora~~ problem.

- Given a class C network id 200.1.2.0. Now we want one subnet with 128 ~~sub~~ ips and two with 64 ips.

one way

0 ⟷

200.1.2.0
to
200.1.2.127



1 1

200.1.2.192
to
200.1.2.255

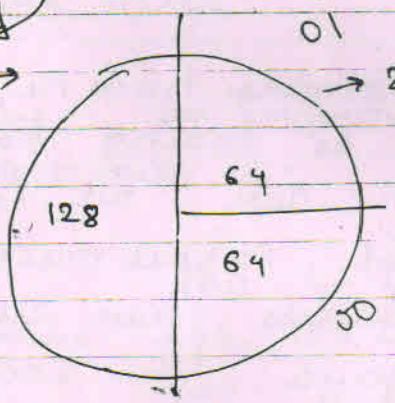
~~0~~ 1 0

200.1.2.128 to
200.1.2.191

Second way

1

200.1.2.128
to
200.1.2.255



0 1

200.1.2.0 to
200.1.2.63

200.1.2.64
to 200.1.2.127.

Special Points :→

→ A EK Subnetmask given hai -

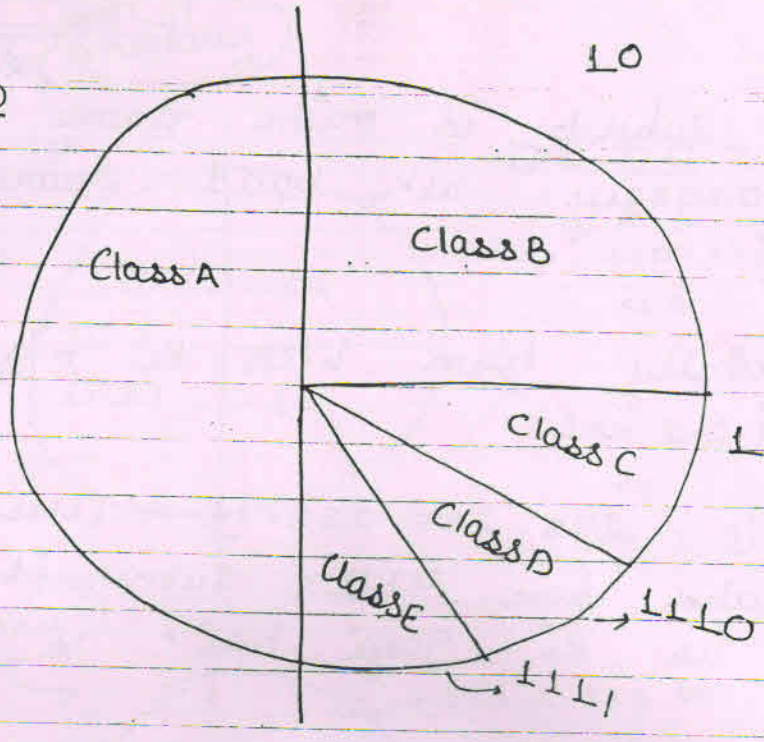
255.255.255.192

- Now kaha hai class C ka subnet.mask hai.

Now hum isase kya-kya findout karsakte.

. No. of Host in each Subnet = $2^6 - 2 = 62$

No. of subnet = $2^2 = 4$



CIDR:→ There are three rules for classless addressing.

i] All the ip address should be contiguous
ii] ip address should be in power of 2
iii] First ip address should be evenly divisible by size of the block.

Example:-

100.1.2.32
100.1.2.33
⋮
100.1.2.47

valid for classless addressing

i] ip addressare continous

ii] No. of ipaddress = 16
⇒ power of 2

iii] First ip address divisible by 16. (2^4)
100.1.2.00100000
Yes divisible

Representation: →

100.1.2.32/28 → net_id

- Block size = No. of ip address possible = $2^{32-28} = 2^4 = 16$.

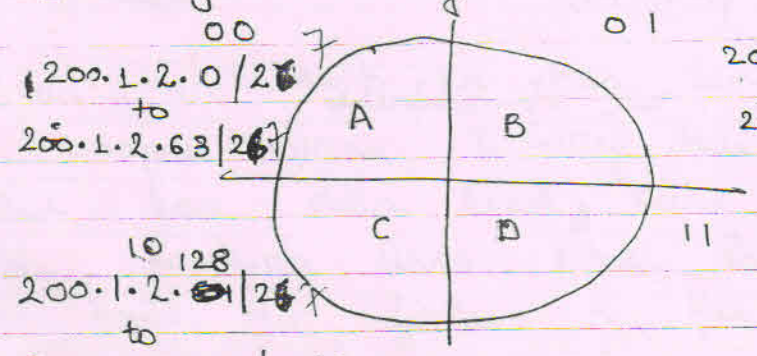
a.b.c.d/n → net_id

yaha par konsa bhi address lgakte ho jo us set mein belong karta hai jaruri nahi ki first ip hi hona jaruri hai.

Subnetting in CIDR:-

→ Given following network id → 200.1.2.3/24
now we want to create four subnet of equal size.

Ans→ Here net_id kitani bit ki hai 25 bits.
and host_id = 32-25 = 7 bits.
aur hamne kitane subnet banane hai four
isliye host mein se starting ki two bits
Subnetting K liye chali gayi.



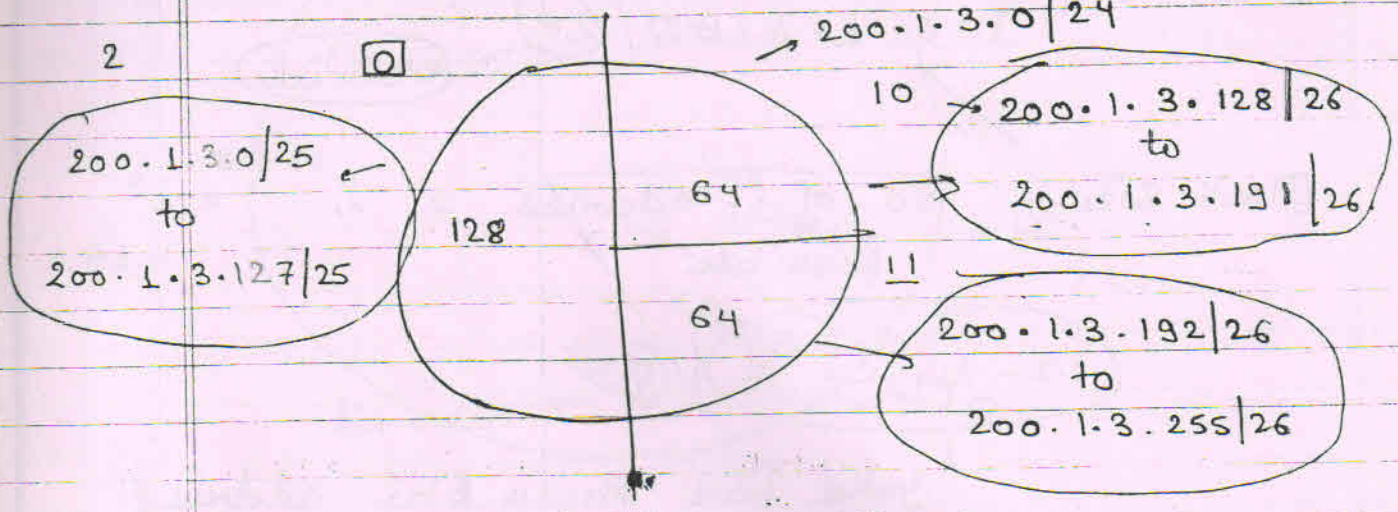
00 → 200.1.2.0/26 to 200.1.2.63/26

01 → 200.1.2.64/26 to 200.1.2.127/26

10 → 200.1.2.128/26 to 200.1.2.191/26

11 → 200.1.2.192/26 to 200.1.2.255/26

• Now Variable Subnetting,



Some important point :→

• Jab hum command prompt par ipconfig type karte toh hamne char chije milti hai -

ipv4
Default Gateway ip
Subnet mask
Domain Name Service

ipv4 - matlab aapke PC ka ip-address then default gateway ip matlab aapke ISP K router ka address jiss aap internet se connect par ho.

• And DNS ka ip-address :