

# Assignment

## Getting Familiar With Your Network

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Windows PowerShell
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\joshi> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::6d20:3d93:9a17:320f%4
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2407:1400:aa55:9ba9:c702:5a00:a491:397
    Temporary IPv6 Address. . . . . : 2407:1400:aa55:9ba9:e42a:2bfb:9c83:dc3b
    Link-local IPv6 Address . . . . . : fe80::714:8b49:c4a1:be5d%10
    IPv4 Address. . . . . : 192.168.1.7
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::2257:afff:fe92:5358%10
                                192.168.1.1

PS C:\Users\joshi> |
```

### 1. IP Address

From the above output, it is clear that my active network interface is Wi-Fi. It has IP Address 192.168.1.7

### 2 Subnet Mask

From the terminal output, we can see the subnet mask for my network is 255.255.255.0

### 3 Network Address

To calculate the network address, we need to perform a bitwise AND operation between our IP address and subnet mask.

The network address and subnet mask for my network are:

- Network Address: 192.168.1.7

- Subnet Mask: 255.255.255.0

Converting these dot values to binary and performing the AND operation we get:

11000000.10101000.00000001.00000111

AND

11111111.11111111.11111111.00000000

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11000000.10101000.00000001.00000000

Converting it back to dot notation, we get 192.168.1.0.

### How Many Nodes Can Your Network Support?

To calculate the number of nodes that a network can support given a network address and a subnet mask, we need to determine the number of host bits available.

The number of host bits is calculated as the total number of bits in an IP address (32 for IPv4) minus the number of bits used for the network.

Given

the subnet mask 255.255.255.0,

we can determine the number of available host addresses as follows:

- The subnet mask 255.255.255.0 in binary is 11111111.11111111.11111111.00000000.
- This means there are 24 network bits and  $32 - 24 = 8$  host bits.
- The number of possible host addresses is  $2^8 - 2 = 256 - 2 = 254$ .

Therefore, the network can support 254 nodes.

### Conclusion

IP Address :192.168.1.7

Subnet Mask: 255.255.255.0

Network Address: 192.168.1.0

Nodes Supported: 254