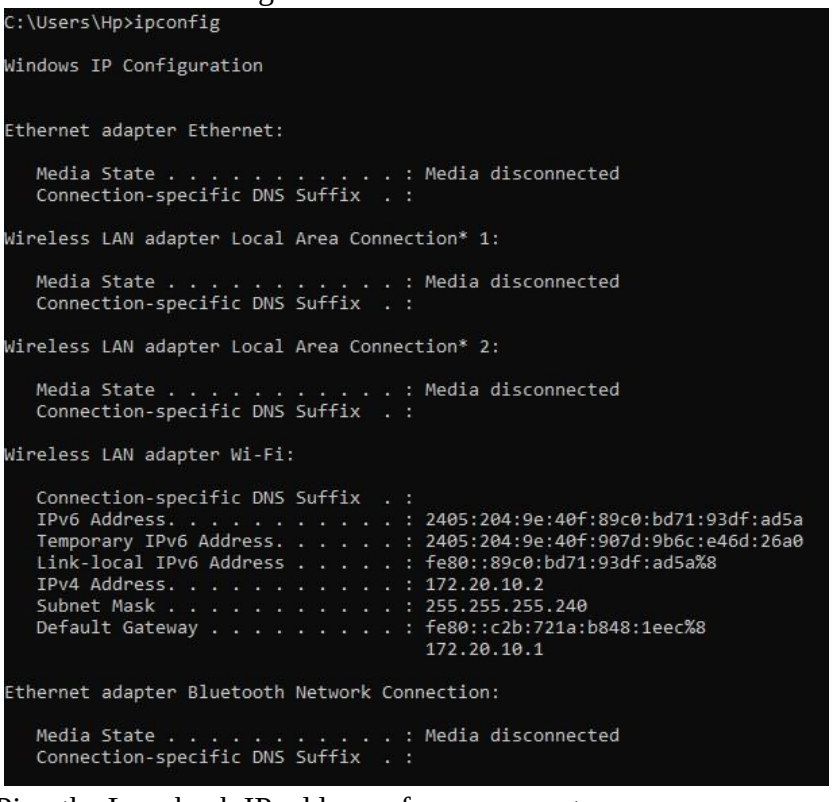
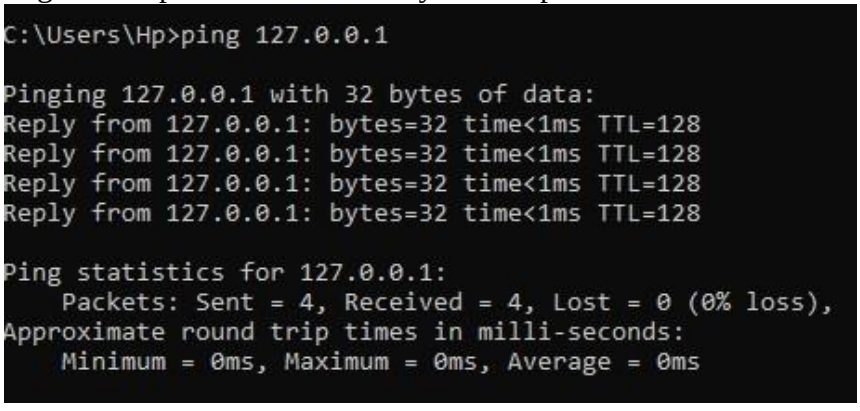
Practical 3

B.1: Procedure of performed experiment

1. Gather TCP/IP configuration information



2. Ping the Loopback IP address of your computer



3. Ping using names like websites

```
C:\Users\Hp>ping www.w3schools.com

Pinging cs837.wac.edgecastcdn.net [192.229.179.87] with 32 bytes of data:
Reply from 192.229.179.87: bytes=32 time=61ms TTL=54
Reply from 192.229.179.87: bytes=32 time=78ms TTL=54
Reply from 192.229.179.87: bytes=32 time=82ms TTL=54
Reply from 192.229.179.87: bytes=32 time=70ms TTL=54

Ping statistics for 192.229.179.87:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 61ms, Maximum = 82ms, Average = 72ms
```

```
C:\Users\Hp>ping www.sololearn.com

Pinging www.sololearn.com [2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3] with 32 bytes of data:
Reply from 2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3: time=368ms
Reply from 2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3: time=83ms
Reply from 2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3: time=81ms
Reply from 2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3: time=224ms

Ping statistics for 2606:4700:8d74:a2b5:9d7:8b:ca0d:58a3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 81ms, Maximum = 368ms, Average = 189ms
```

4. Trace the route to any website

```
C:\Users\Hp>tracert www.w3schools.com

Tracing route to cs837.wac.edgecastcdn.net [192.229.179.87]
over a maximum of 30 hops:

  1    74 ms    98 ms     2 ms  172.20.10.1
  2     *        *        *     Request timed out.
  3    45 ms    55 ms    56 ms  10.71.2.194
  4    48 ms    45 ms    36 ms  192.168.70.215
  5   359 ms    76 ms    81 ms  192.168.70.214
  6     *        *        *     Request timed out.
  7    37 ms    50 ms    77 ms  172.25.50.6
  8     *        *        *     Request timed out.
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15   130 ms   201 ms   303 ms  192.229.179.87

Trace complete.
```

```
C:\Users\Hp>tracert www.sololearn.com

Tracing route to www.sololearn.com [2606:4700:8d74:a2b5:9d7:3:ca0d:58a3]
over a maximum of 30 hops:

  1     4 ms     2 ms     3 ms  2405:204:9e:40f:1560:74fa:cfe:8803
  2     *        *        *     Request timed out.
  3    92 ms    85 ms    54 ms  2405:200:310:11::3
  4    72 ms    78 ms    73 ms  2405:200:801:200::1ca1
  5    68 ms    48 ms    56 ms  2405:200:801:200::1ca0
  6     *        *        *     Request timed out.
  7     *        *        *     Request timed out.
  8   243 ms    99 ms    45 ms  2405:200:1602:600:49:44:187:2b
  9    53 ms    63 ms    90 ms  2606:4700:8d74:a2b5:9d7:3:ca0d:58a3

Trace complete.
```

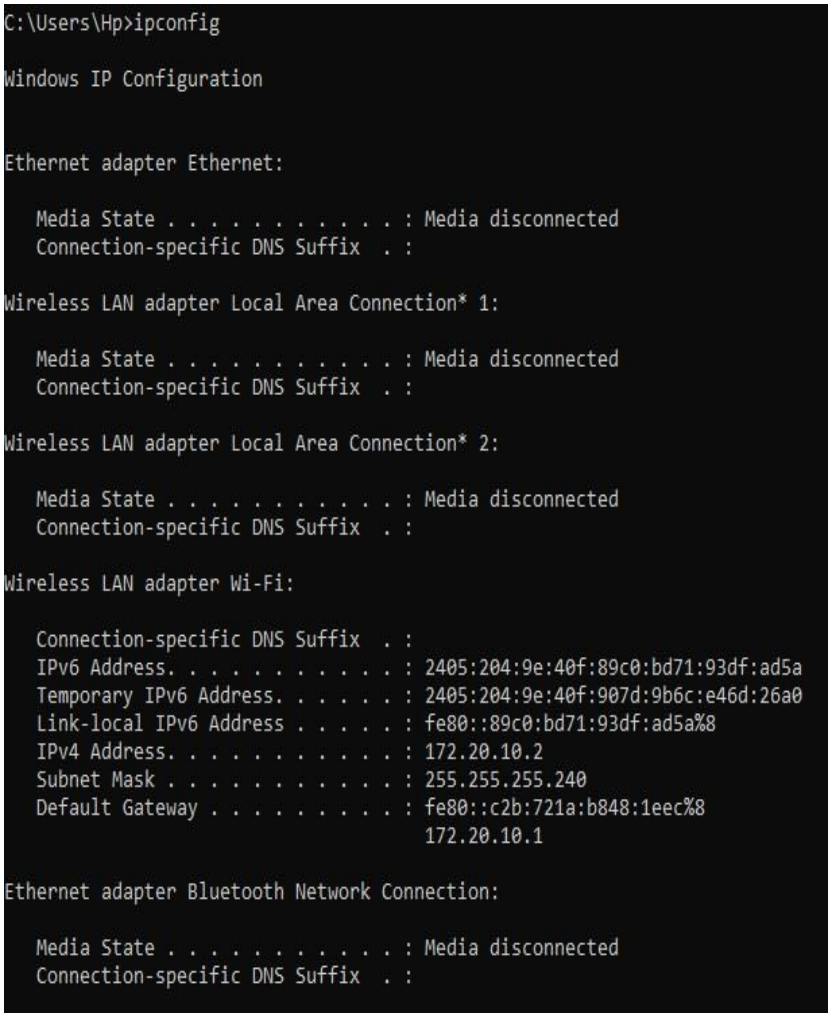
5. Execute other commands to examine a network

PATH PING:

```
C:\Users\Hp>pathping www.sololearn.com

Tracing route to www.sololearn.com [2606:4700:8d74:a2b5:9d7:3:ca0d:58a3]
over a maximum of 30 hops:
  0  Vidhi [2405:204:9e:40f:907d:9b6c:e46d:26a0]
  1  2405:204:9e:40f:1560:74fa:cfe:8803
  2     *        *        *
Computing statistics for 25 seconds...
           Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           Vidhi [2405:204:9e:40f:907d:9b6c:e4

                                 7/ 100 =  7%   |
  1   37ms     7/ 100 =  7%     0/ 100 =  0%  2405:204:9e:40f:1560:74fa:cfe:8803

Trace complete.
```

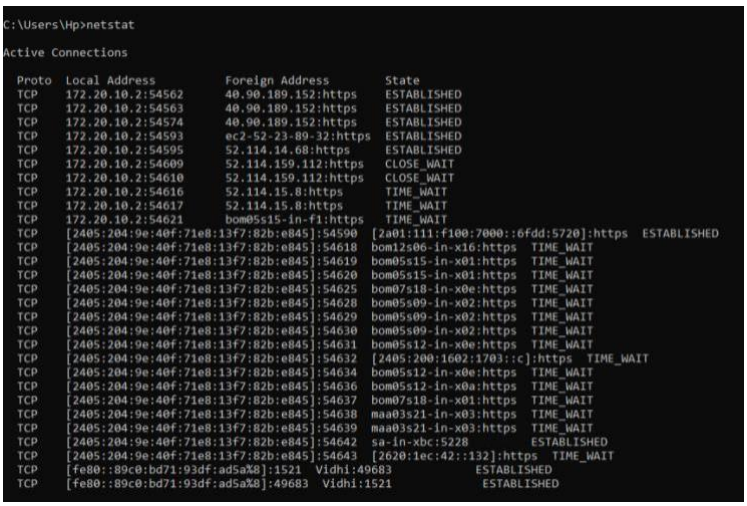
```
C:\Users\Hp>pathping www.w3schools.com

Tracing route to cs837.wac.edgecastcdn.net [192.229.179.87]
over a maximum of 30 hops:
  0  Vidhi [172.20.10.2]
  1  172.20.10.1
  2     *        *        *
Computing statistics for 25 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           Vidhi [172.20.10.2]
                                   0/ 100 =  0%   |
  1   19ms     0/ 100 =  0%     0/ 100 =  0%  172.20.10.1

Trace complete.
```

ipconfig:



```
C:\Users\Hp>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

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

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. . . . . . . . . . . : 2405:204:9e:40f:89c0:bd71:93df:ad5a
   Temporary IPv6 Address. . . . . . : 2405:204:9e:40f:907d:9b6c:e46d:26a0
   Link-local IPv6 Address . . . . . : fe80::89c0:bd71:93df:ad5a%8
   IPv4 Address. . . . . . . . . . . : 172.20.10.2
   Subnet Mask . . . . . . . . . . . : 255.255.255.240
   Default Gateway . . . . . . . . . : fe80::c2b:721a:b848:1eec%8
                                       172.20.10.1

Ethernet adapter Bluetooth Network Connection:

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

Netstat:



```
C:\Users\Hp>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    172.20.10.2:54562      40.90.189.152:https    ESTABLISHED
  TCP    172.20.10.2:54563      40.90.189.152:https    ESTABLISHED
  TCP    172.20.10.2:54574      40.90.189.152:https    ESTABLISHED
  TCP    172.20.10.2:54593      ec2-52-23-89-32:https  ESTABLISHED
  TCP    172.20.10.2:54595      52.114.14.68:https     ESTABLISHED
  TCP    172.20.10.2:54609      52.114.159.112:https   CLOSE_WAIT
  TCP    172.20.10.2:54610      52.114.159.112:https   CLOSE_WAIT
  TCP    172.20.10.2:54616      52.114.15.8:https      TIME_WAIT
  TCP    172.20.10.2:54617      52.114.15.8:https      TIME_WAIT
  TCP    172.20.10.2:54621      bom05s15-in-f1:https   TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54590  [2a01:111:f100:7000::6fdd:5720]:https  ESTABLISHED
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54618  bom12s06-in-x16:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54619  bom05s15-in-x01:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54620  bom05s15-in-x01:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54625  bom07s18-in-x0e:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54628  bom05s09-in-x02:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54629  bom05s09-in-x02:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54630  bom05s09-in-x02:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54631  bom05s12-in-x0e:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54632  [2405:200:1602:1703::c]:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54634  bom05s12-in-x0e:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54636  bom05s12-in-x0a:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54637  bom07s18-in-x01:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54638  maa03s21-in-x03:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54639  maa03s21-in-x03:https  TIME_WAIT
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54642  sa-in-xbc:5228         ESTABLISHED
  TCP    [2405:204:9e:40f:71e8:13f7:82b:e845]:54643  [2620:1ec:42::132]:https  TIME_WAIT
  TCP    [fe80::89c0:bd71:93df:ad5a%8]:1521  Vidhi:49683            ESTABLISHED
  TCP    [fe80::89c0:bd71:93df:ad5a%8]:49683  Vidhi:1521            ESTABLISHED
```

Nslookup

```
C:\Users\Hp>nslookup www.sololearn.com
DNS request timed out.
    timeout was 2 seconds.
Server:  UnKnown
Address:  fe80::1ca1:71a6:6141:606c

Non-authoritative answer:
Name:    www.sololearn.com
Addresses:  2606:4700:8d74:a2b5:9d7:8a:ca0d:58a3
          172.67.7.142
          104.22.10.227
          104.22.11.227
```

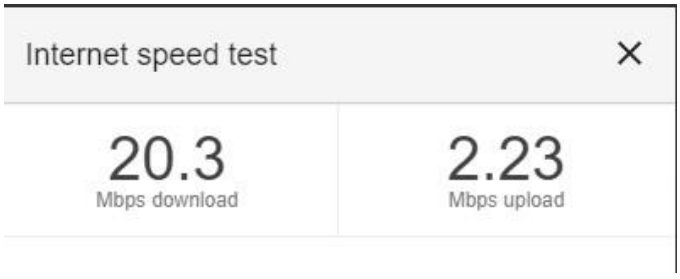
```
C:\Users\Hp>nslookup www.w3schools.com
DNS request timed out.
    timeout was 2 seconds.
Server:  UnKnown
Address:  fe80::1ca1:71a6:6141:606c

Non-authoritative answer:
Name:    cs837.wac.edgecastcdn.net
Address:  192.229.179.87
Aliases:  www.w3schools.com
```

Route:

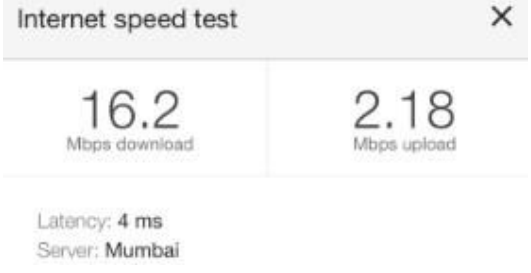
```
C:\Users\Hp>route www.w3schools.com

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
                  [MASK netmask]  [gateway] [METRIC metric]  [IF interface]

  -f           Clears the routing tables of all gateway entries.  If this is
               used in conjunction with one of the commands, the tables are
               cleared prior to running the command.

  -p           When used with the ADD command, makes a route persistent across
               boots of the system. By default, routes are not preserved
               when the system is restarted. Ignored for all other commands,
               which always affect the appropriate persistent routes.

  -4           Force using IPv4.

  -6           Force using IPv6.

  command      One of these:
                 PRINT     Prints  a route
                 ADD       Adds    a route
                 DELETE    Deletes a route
                 CHANGE    Modifies an existing route
  destination  Specifies the host.
  MASK         Specifies that the next parameter is the 'netmask' value.
  netmask      Specifies a subnet mask value for this route entry.
               If not specified, it defaults to 255.255.255.255.
  gateway      Specifies gateway.
  interface    the interface number for the specified route.
  METRIC       specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1. 157.*. 127.*. *224*.

Pattern match is only allowed in PRINT command.
Diagnostic Notes:
    Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
    Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
             The route addition failed: The specified mask parameter is invalid. (Destination & Mask) != Destination.

Examples:

    > route PRINT
    > route PRINT -4
    > route PRINT -6
    > route PRINT 157*          .... Only prints those matching 157*

    > route ADD 157.0.0.0 MASK 255.0.0.0  157.55.80.1 METRIC 3 IF 2
              destination^      ^mask      ^gateway     metric^    ^
                                                        Interface^
      If IF is not given, it tries to find the best interface for a given
      gateway.
    > route ADD 3ffe::/32 3ffe::1

    > route CHANGE 157.0.0.0 MASK 255.0.0.0 157.55.80.5 METRIC 2 IF 2

      CHANGE is used to modify gateway and/or metric only.

    > route DELETE 157.0.0.0
    > route DELETE 3ffe::/32
```

6. MAC address/ Mobile and laptop speed

LAPTOP:
MAC address: 80-C5-F2-F64A-69
Speed:



MOBILE:
MAC address: 64:A5:C3:55:99:EA
Speed:



B.2: Observations and Learning's:

In the above experiment, we learnt various commands that will give us details regarding our network. We found out how a request travels from our devices to the server and back. We also checked the speed of internet of out=r laptops and mobile phones.

B.3: Conclusion:

An error in connecting to a website can be easily decoded using the commands we learnt in this experiment. We can also find the speed of various networks easily.