

Network setup & commands

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For internal use only!

Network setup

4 necessary properties to use network on a computer:

- IP address
- Netmask
- Gateway
- DNS server

They are given by the Internet Service Provider (ISP).

Either the user do their setup or use DHCP (if possible).

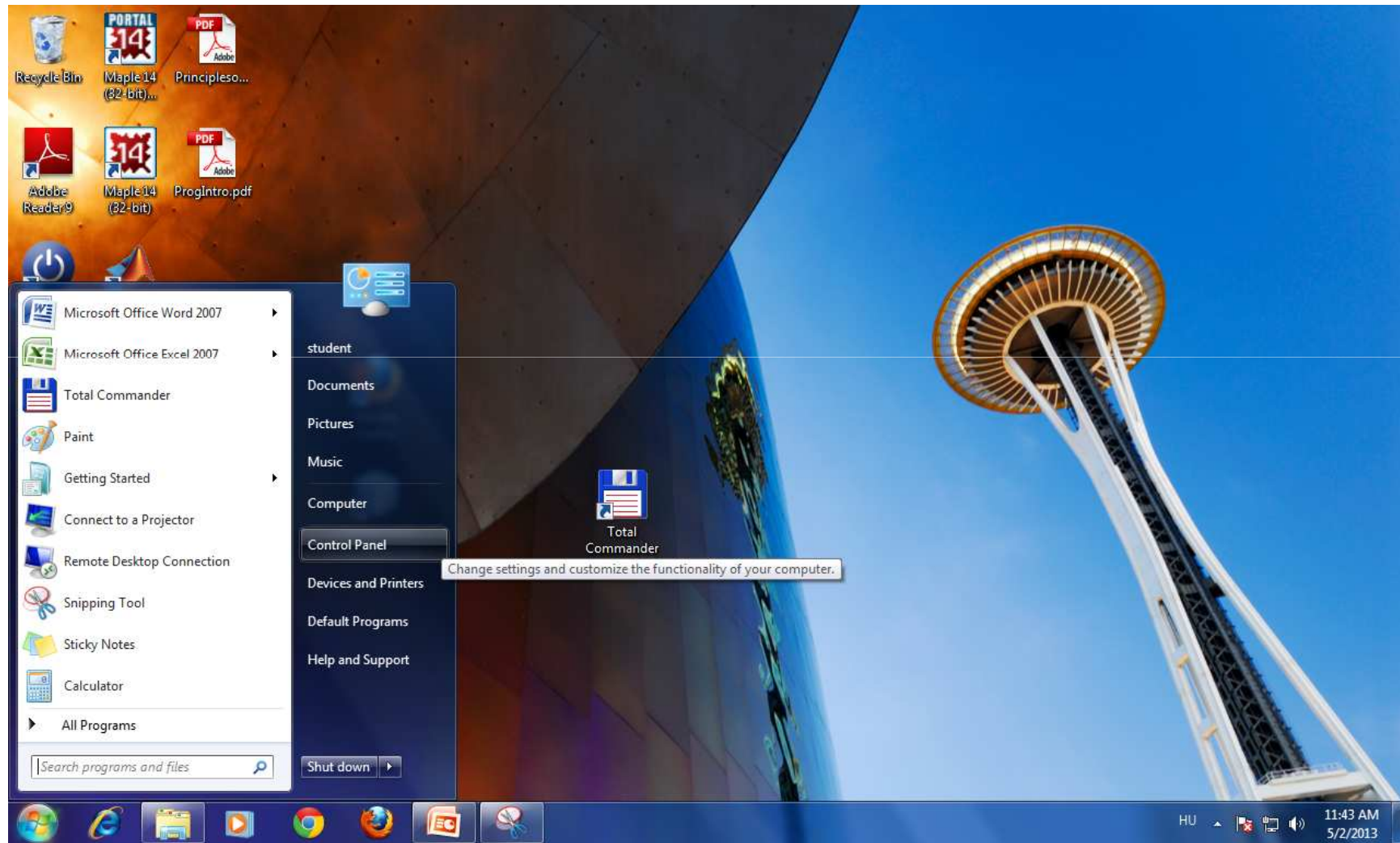
The user can use 'command prompt' or GUI (Graphical User Interface) to do setup process.

Network setup by Control Panel*

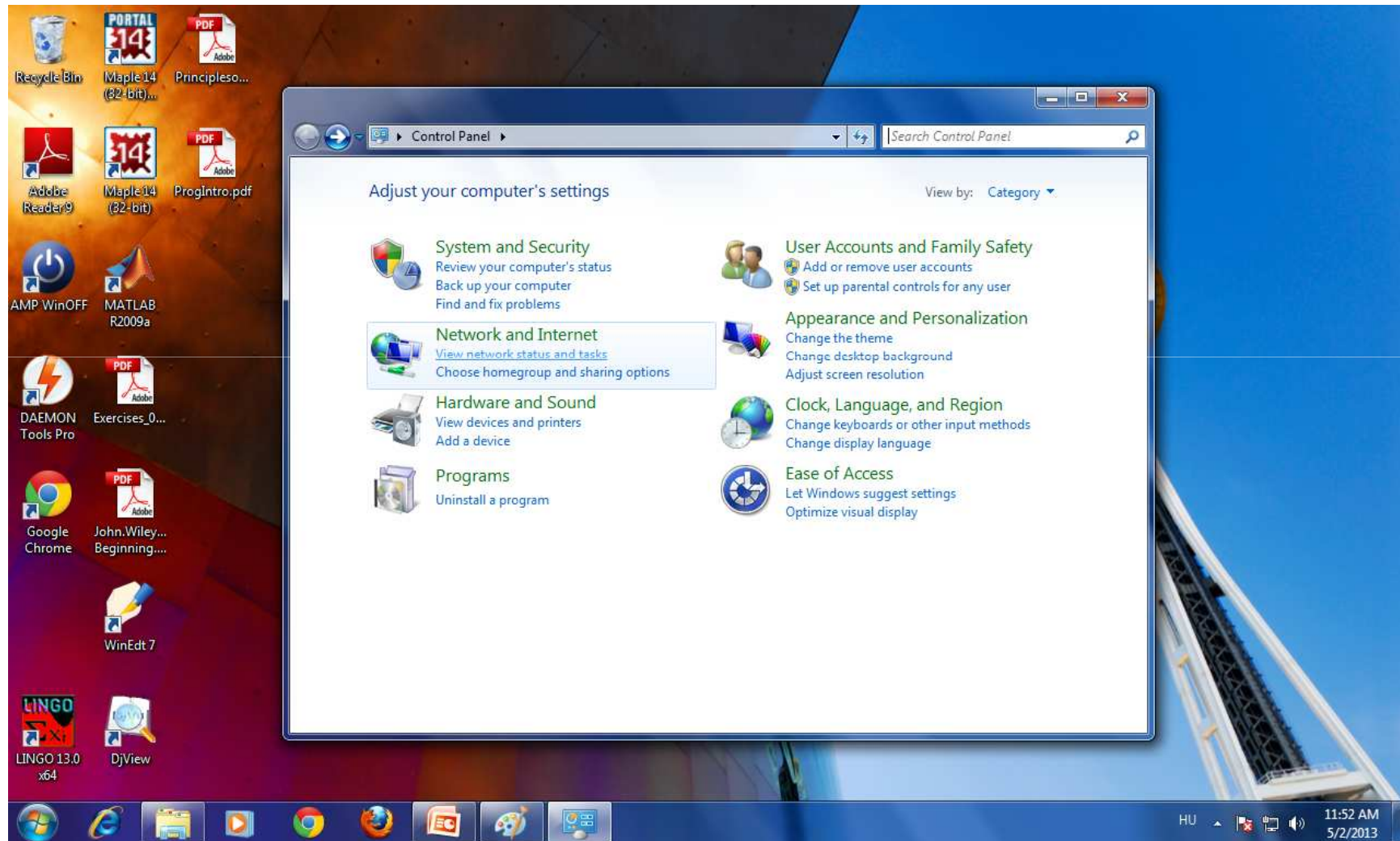
1. Go to Start Menu
2. 'Control Panel'
3. 'View network status and tasks'
in 'Network and Internet' block
4. 'Change adapter settings'
5. Right mouse click on the adapter, choose 'Properties'
6. Choose 'Internet Protocol Version 4 (TCP/IPv4)' and
push button 'Properties'
7. Choose automatic configuration (DHCP) or give the
four datas.

* on Windows 7 operating system

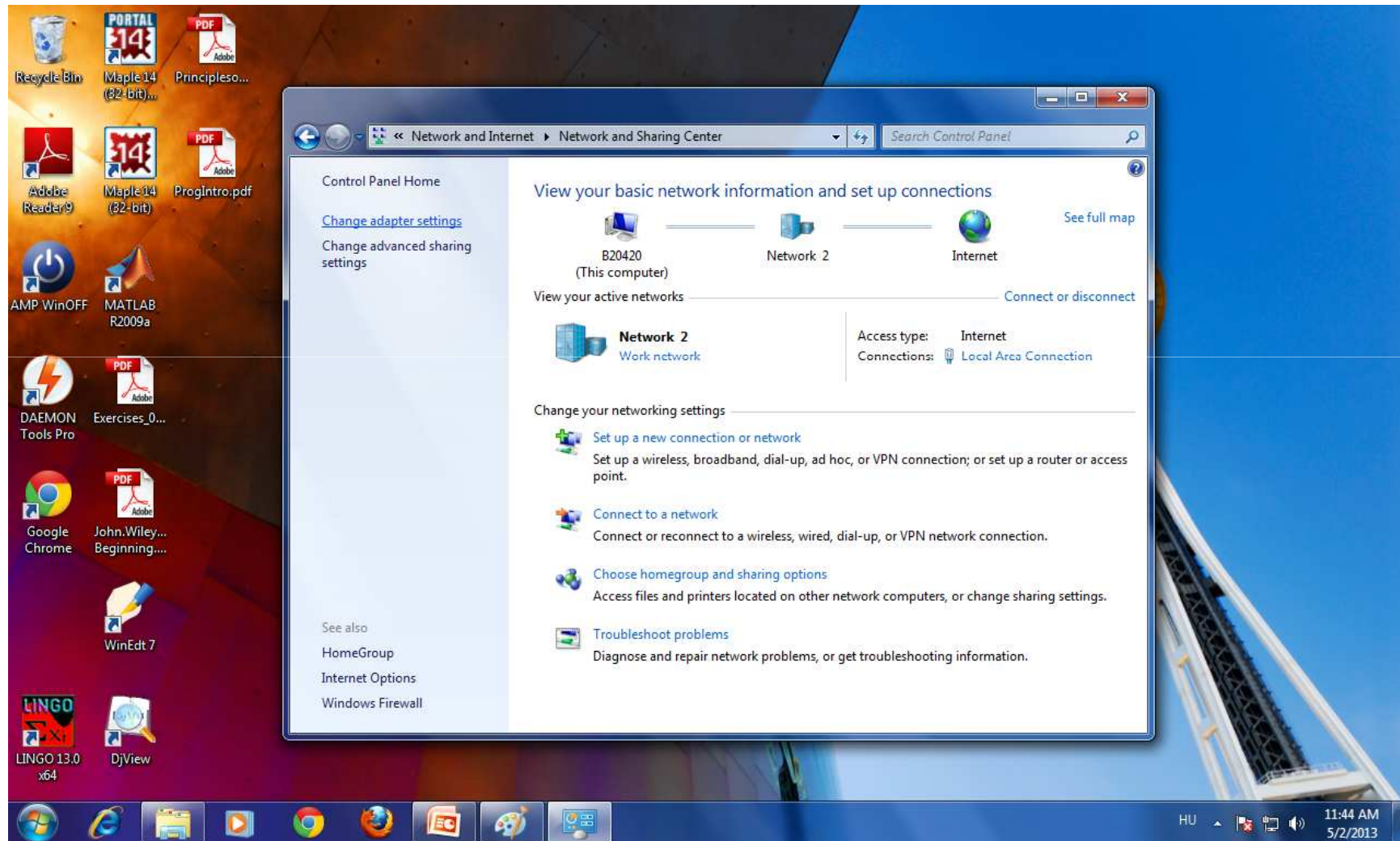
1 Start menu



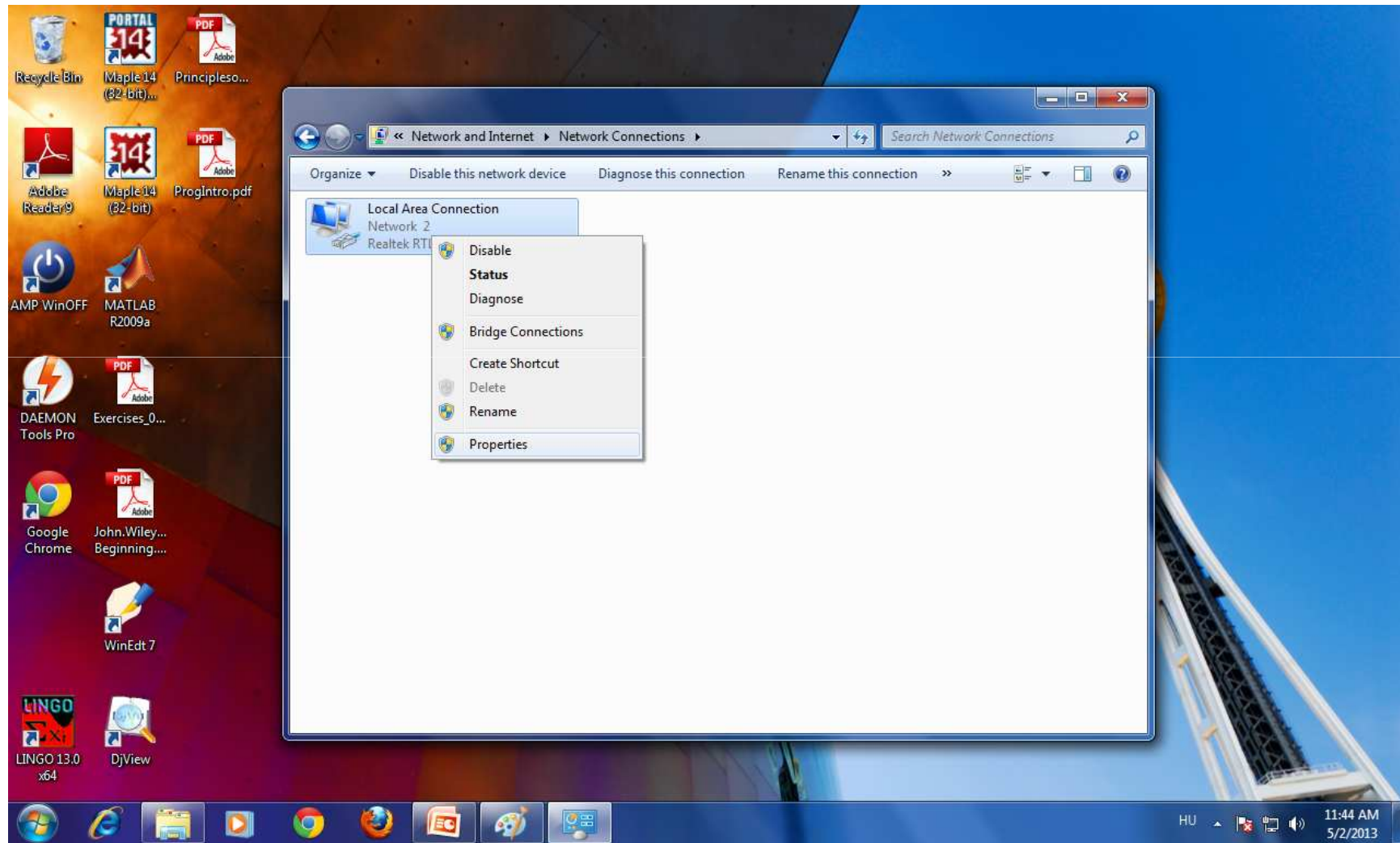
2 Control Panel



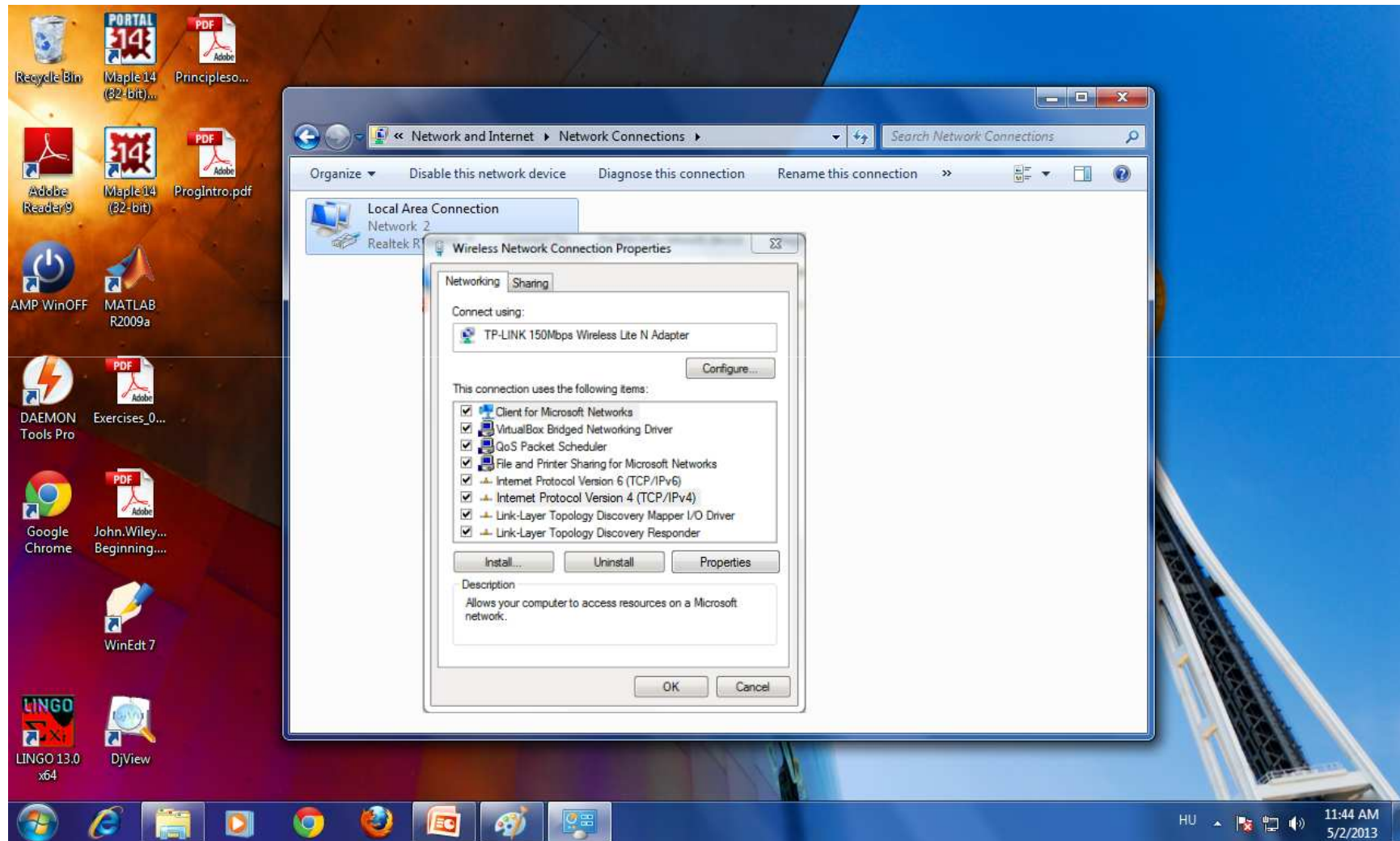
3 Network and Sharing Center



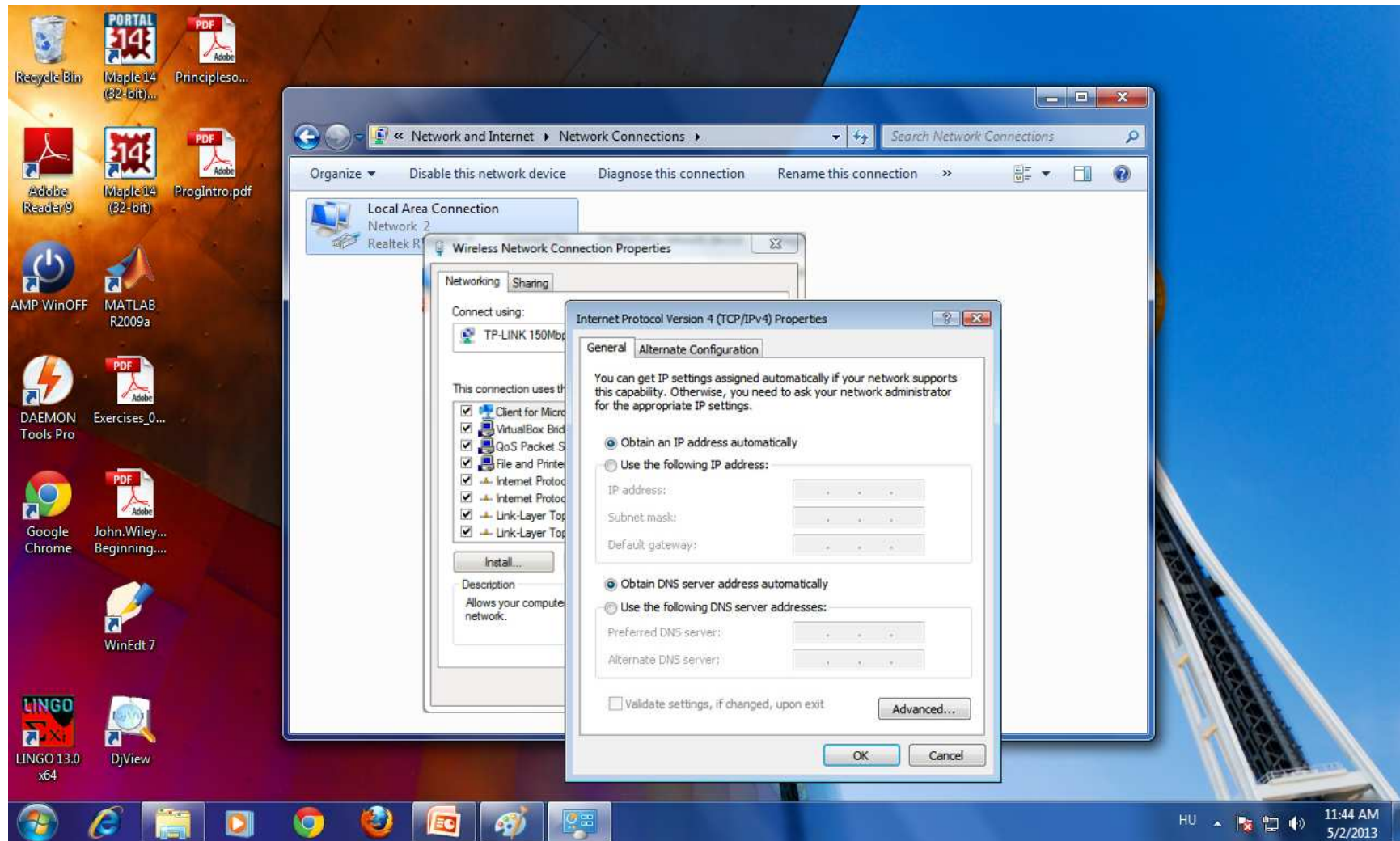
4 Network connections



5 Connection properties



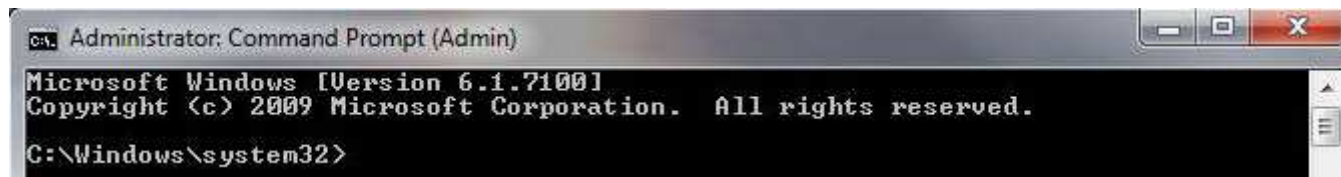
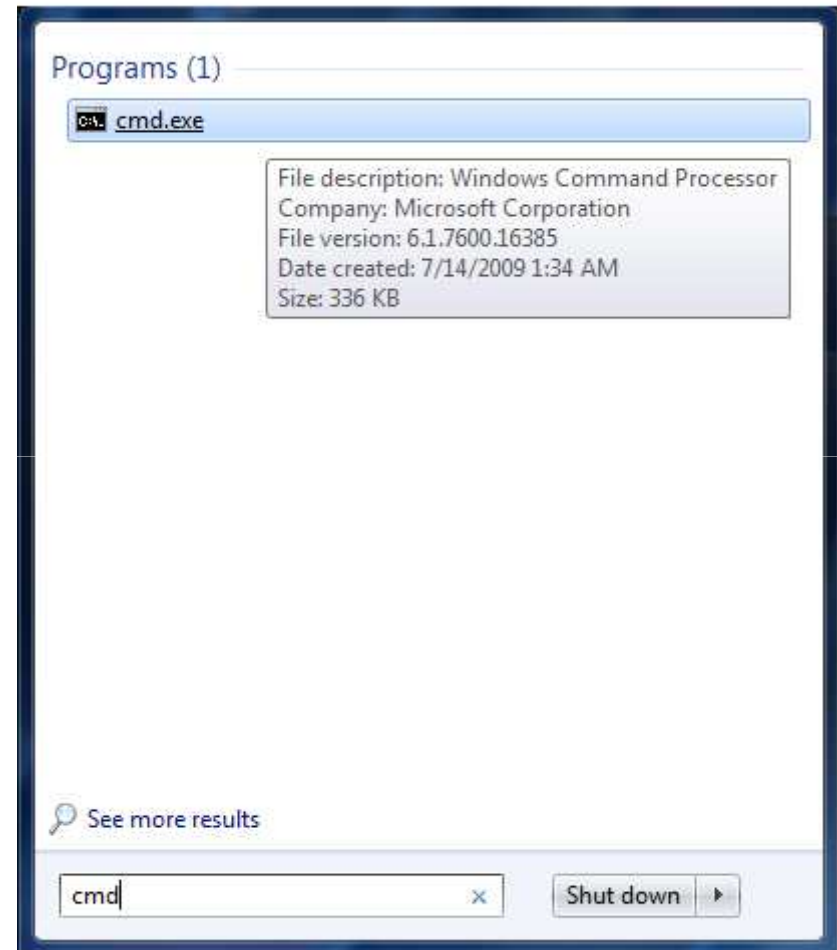
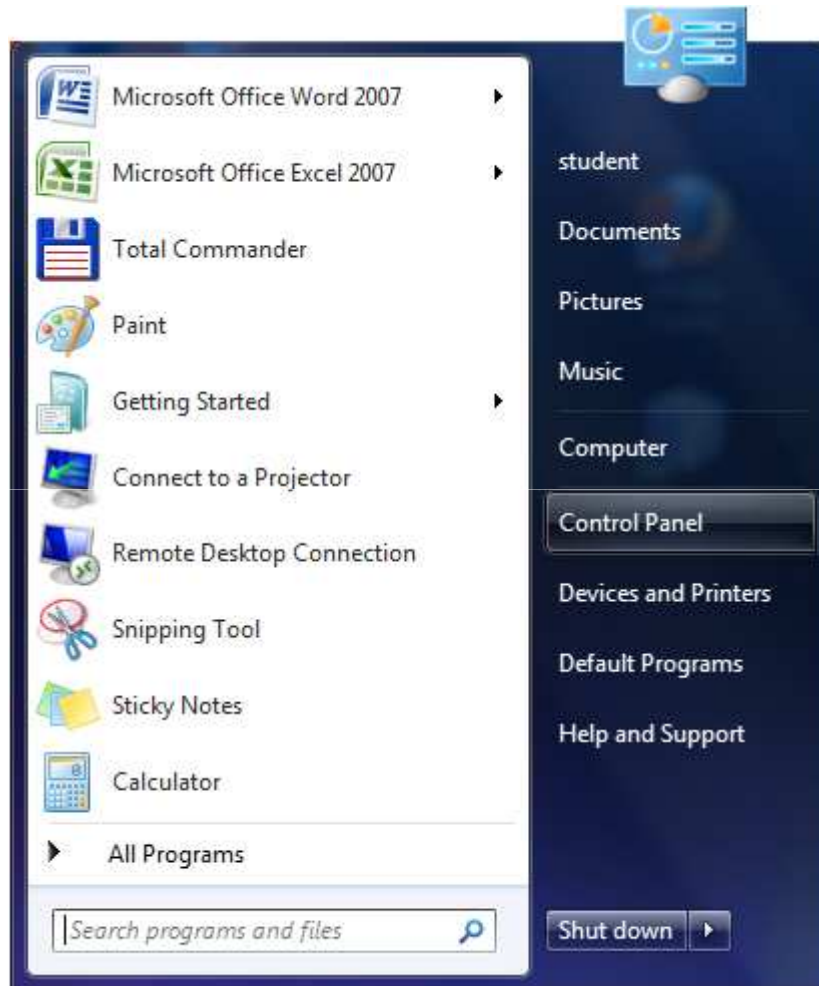
6 TCP/IPv4 Properties



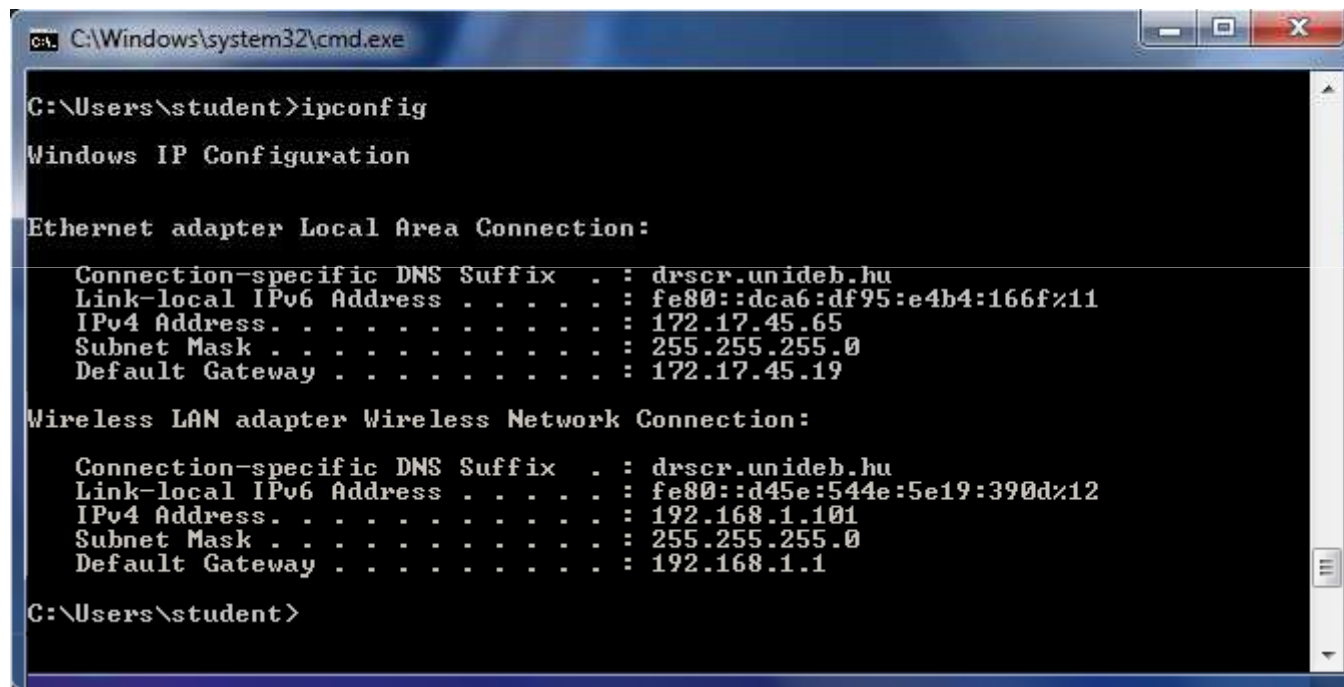
Useful network commands

- `ipconfig`: Shows the setups of network adapters.
- `ipconfig /all`: Shows the detailed setups of network adapters.
- `route print`: Shows the routing table of the computer.
- `ping <node>`: Check connection to other computers.
- `arp -a`: Shows ARP table.
- `tracert <node>`: Show the hops to a computer.
- `netstat -s`: Shows network statistics (IP, TCP, UDP).

Command prompt



ipconfig



```
C:\Windows\system32\cmd.exe

C:\Users\student>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : drscr.unideb.hu
    Link-local IPv6 Address . . . . . : fe80::dca6:df95:e4b4:166f%11
    IPv4 Address. . . . . : 172.17.45.65
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 172.17.45.19

Wireless LAN adapter Wireless Network Connection:

    Connection-specific DNS Suffix  . : drscr.unideb.hu
    Link-local IPv6 Address . . . . . : fe80::d45e:544e:5e19:390d%12
    IPv4 Address. . . . . : 192.168.1.101
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

C:\Users\student>
```

ipconfig /all

```
C:\Windows\system32\cmd.exe

C:\Users\student>ipconfig /all

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Description . . . . . : Marvell Yukon 88E8001/8003/8010 PCI Gigabit Ethernet Controller
    Physical Address. . . . . : 00-18-F3-64-D9-67
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::dca6:df95:e4b4:166f%11
    Autoconfiguration IPv4 Address. . . : 172.17.45.65    <Preferred>
    Subnet Mask . . . . . : 255.255.255.0
    Lease Obtained. . . . . : 14 November, 2010 18:47:48
    Lease Expires . . . . . : 15 November, 2010 18:47:48
    Default Gateway . . . . . : 172.17.45.19
    DHCPv6 IAID . . . . . : 234887411
    DHCPv6 Client DUID. . . . . : 00-01-00-01-12-75-FB-B3-00-18-F3-64-D9-67
    DNS Servers . . . . . : 193.6.128.5
    NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>
```


route print

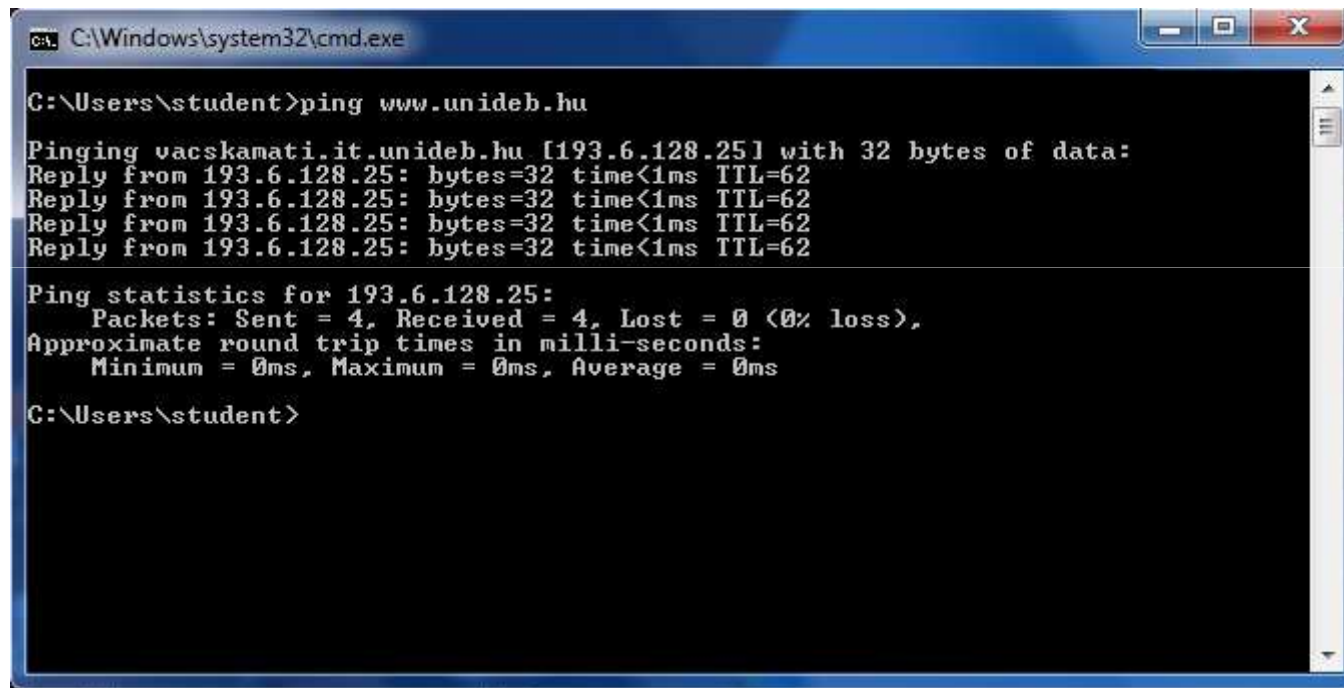
```
C:\Windows\system32\cmd.exe

C:\Users\student>route print

=====
Interface List
11...6c 62 6d 21 66 .....Realtek RTL8168D/8111D Family PCI-E Gigabit Ethernet NIC (NDIS 6.20)
12...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter
13...00 00 00 00 00 00 00 e0 Microsoft 6to4 Adapter
14...00 00 00 00 00 00 00 e0 Teredo Tunneling Pseudo-Interface
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          172.17.45.19      172.17.45.65     10
127.0.0.0                  255.0.0.0        On-link           127.0.0.1         306
127.0.0.1                  255.255.255.255  On-link           127.0.0.1         306
127.255.255.255            255.255.255.255  On-link           127.0.0.1         306
172.17.45.0                255.255.255.0    On-link           172.17.45.65     266
172.17.45.65              255.255.255.255  On-link           172.17.45.65     266
172.17.45.255             255.255.255.255  On-link           172.17.45.65     266
224.0.0.0                  240.0.0.0        On-link           127.0.0.1         306
224.0.0.0                  240.0.0.0        On-link           172.17.45.65     266
255.255.255.255           255.255.255.255  On-link           127.0.0.1         306
255.255.255.255           255.255.255.255  On-link           172.17.45.65     266
=====
```

ping (normal)



```
C:\Windows\system32\cmd.exe

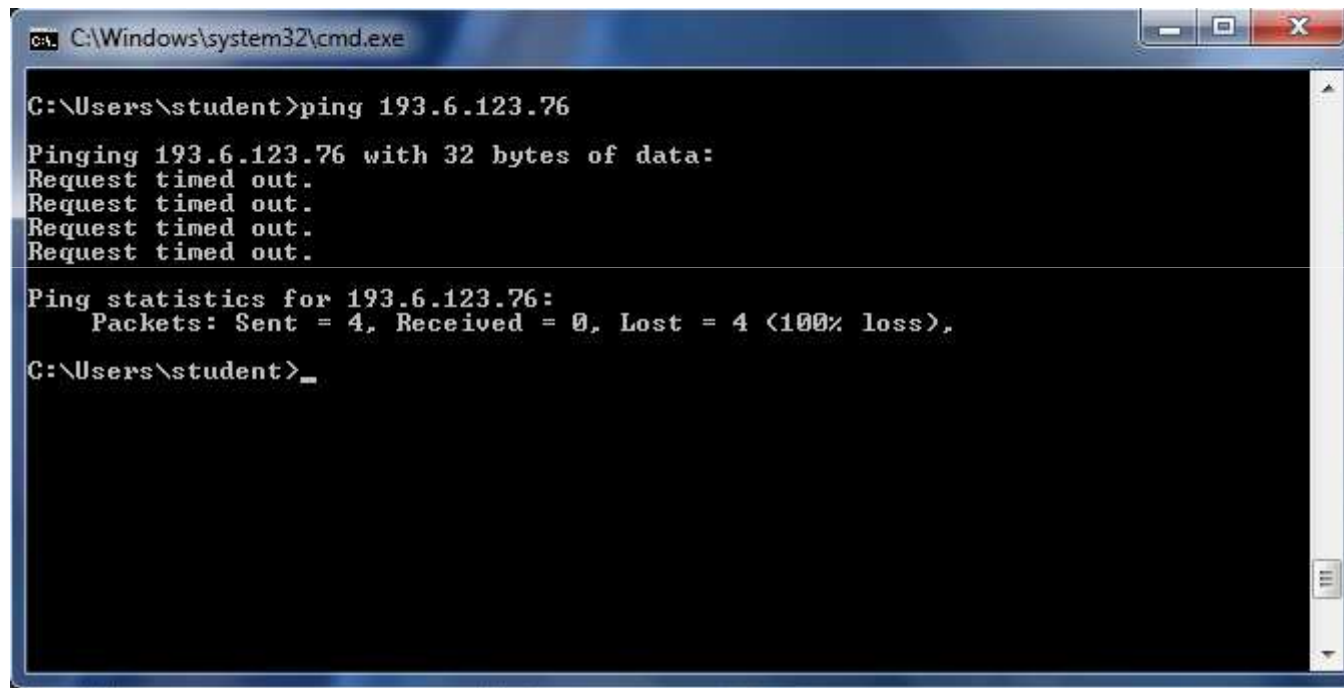
C:\Users\student>ping www.unideb.hu

Pinging vacskamati.it.unideb.hu [193.6.128.251] with 32 bytes of data:
Reply from 193.6.128.25: bytes=32 time<1ms TTL=62
Reply from 193.6.128.25: bytes=32 time<1ms TTL=62
Reply from 193.6.128.25: bytes=32 time<1ms TTL=62
Reply from 193.6.128.25: bytes=32 time<1ms TTL=62

Ping statistics for 193.6.128.25:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\student>
```

ping (destination unreachable)



A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Windows\system32\cmd.exe'. The command prompt shows the user 'student' at 'C:\Users\student' typing the command 'ping 193.6.123.76'. The output shows four 'Request timed out.' messages, followed by ping statistics indicating a 100% loss of packets.

```
C:\Windows\system32\cmd.exe

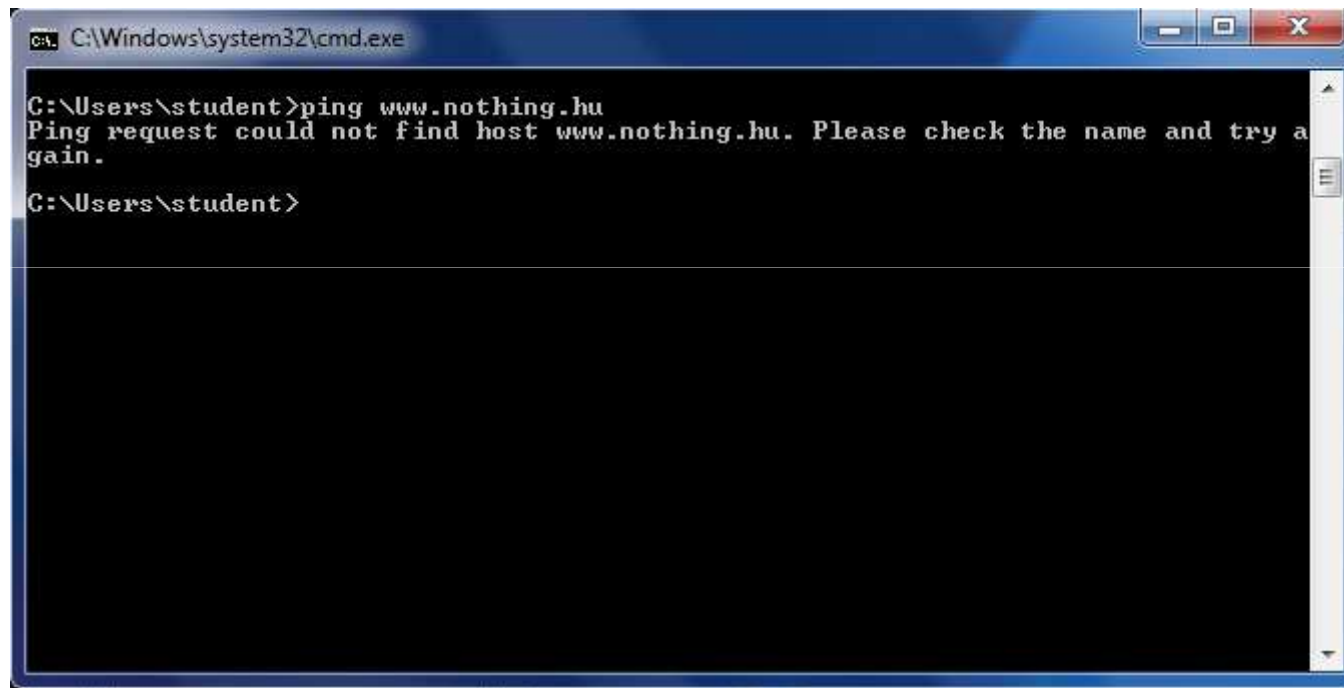
C:\Users\student>ping 193.6.123.76

Pinging 193.6.123.76 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 193.6.123.76:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\student>
```

ping (DNS error)



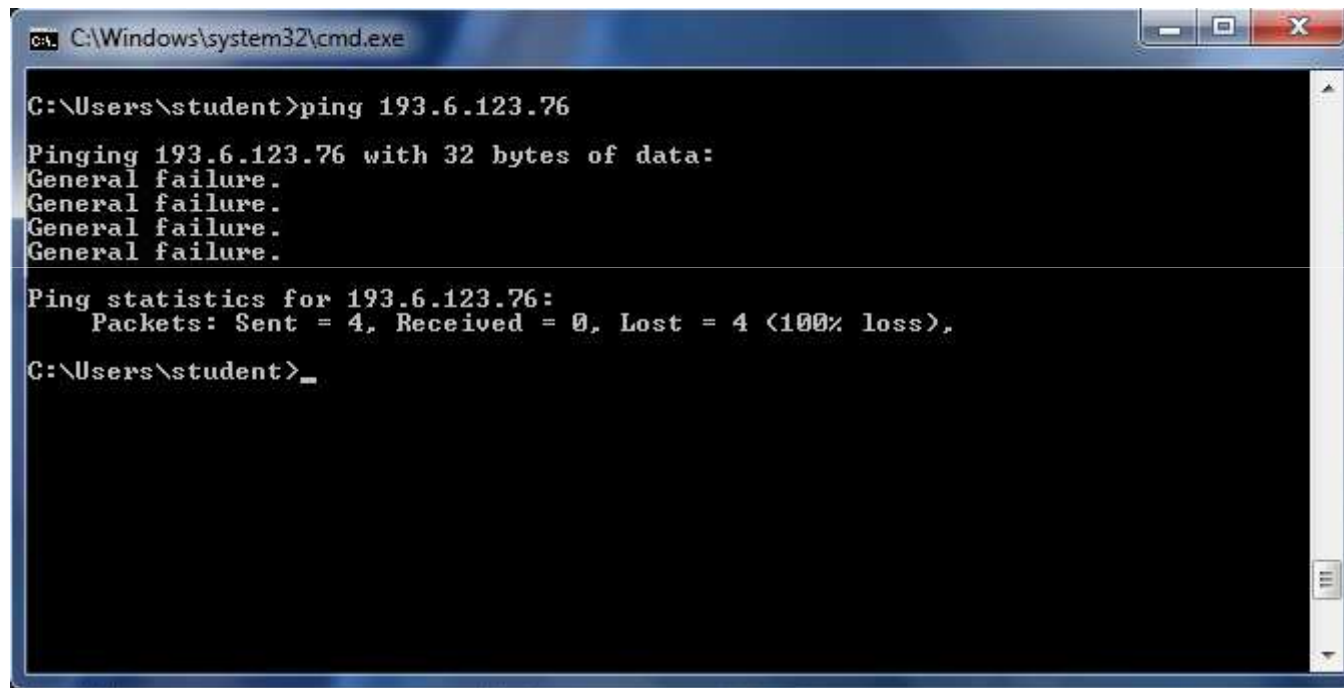
A screenshot of a Windows command prompt window. The title bar at the top reads "C:\Windows\system32\cmd.exe". The command prompt shows the user's current directory as "C:\Users\student". The user has entered the command "ping www.nothing.hu". The output of the command is "Ping request could not find host www.nothing.hu. Please check the name and try again." followed by a new prompt line "C:\Users\student>".

```
C:\Windows\system32\cmd.exe

C:\Users\student>ping www.nothing.hu
Ping request could not find host www.nothing.hu. Please check the name and try again.

C:\Users\student>
```

ping (general failure)



A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Windows\system32\cmd.exe'. The command prompt shows the user 'student' at the 'C:\Users\student' directory. The user has entered the command 'ping 193.6.123.76'. The output shows four 'General failure.' messages, followed by ping statistics for 193.6.123.76: 'Packets: Sent = 4, Received = 0, Lost = 4 (100% loss)'. The prompt ends with a cursor.

```
C:\Windows\system32\cmd.exe

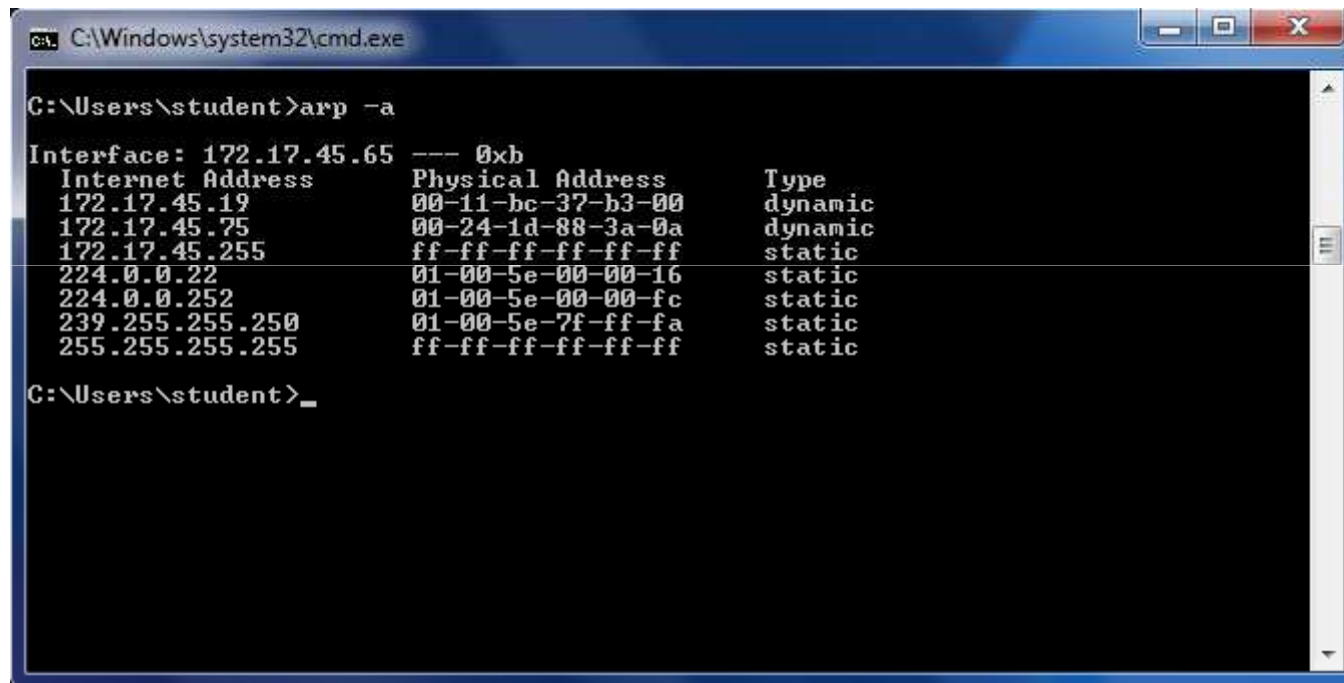
C:\Users\student>ping 193.6.123.76

Pinging 193.6.123.76 with 32 bytes of data:
General failure.
General failure.
General failure.
General failure.

Ping statistics for 193.6.123.76:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\student>
```


arp -a



A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Windows\system32\cmd.exe'. The command prompt shows the user 'student' at 'C:\Users\student' running the command 'arp -a'. The output displays the ARP table for the interface 172.17.45.65. It lists several IP addresses and their corresponding physical addresses and types. The first two entries are dynamic, while the others are static.

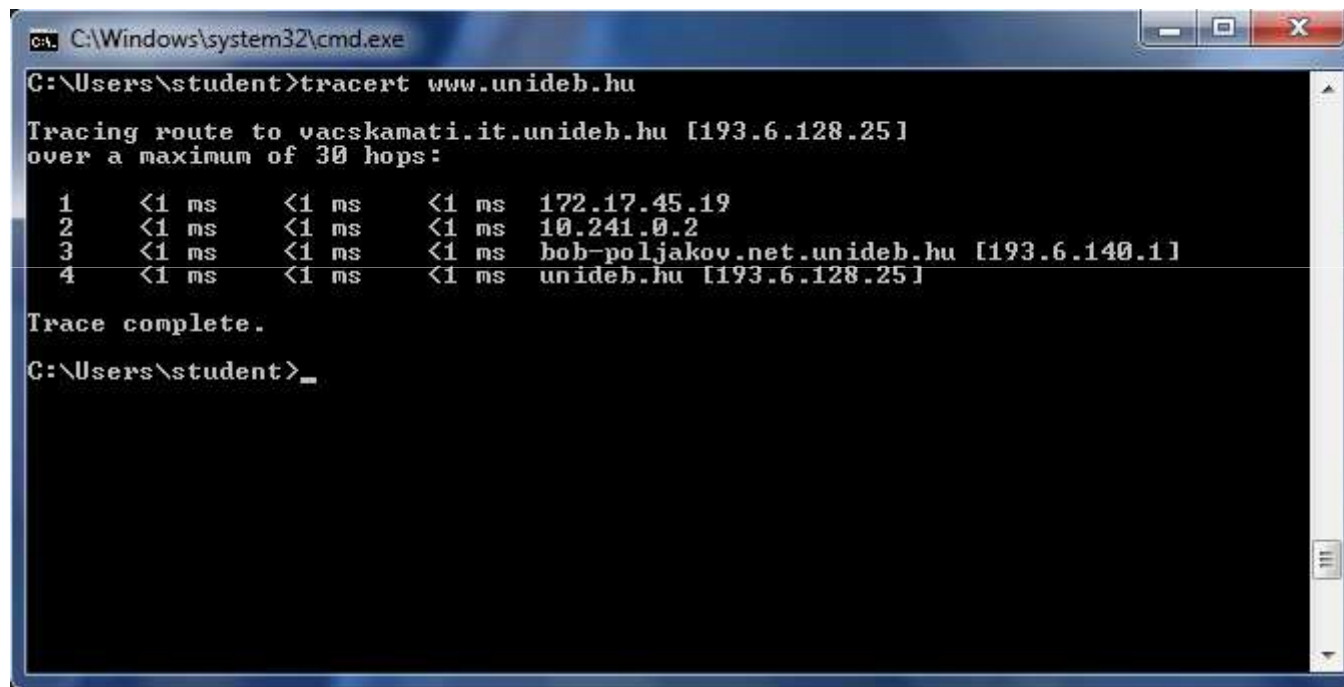
```
C:\Windows\system32\cmd.exe

C:\Users\student>arp -a

Interface: 172.17.45.65 --- 0xb
Internet Address      Physical Address      Type
172.17.45.19          00-11-bc-37-b3-00     dynamic
172.17.45.75          00-24-1d-88-3a-0a     dynamic
172.17.45.255         ff-ff-ff-ff-ff-ff     static
224.0.0.22            01-00-5e-00-00-16     static
224.0.0.252           01-00-5e-00-00-fc     static
239.255.255.250       01-00-5e-7f-ff-fa     static
255.255.255.255       ff-ff-ff-ff-ff-ff     static

C:\Users\student>_
```

tracert



```
C:\Windows\system32\cmd.exe
C:\Users\student>tracert www.unideb.hu

Tracing route to vacskamati.it.unideb.hu [193.6.128.25]
over a maximum of 30 hops:
  0  <1 ms    <1 ms    <1 ms    172.17.45.19
  1  <1 ms    <1 ms    <1 ms    10.241.0.2
  2  <1 ms    <1 ms    <1 ms    bob-poljakov.net.unideb.hu [193.6.140.1]
  3  <1 ms    <1 ms    <1 ms    unideb.hu [193.6.128.25]

Trace complete.
C:\Users\student>
```

Netstat -s

```
C:\Windows\system32\cmd.exe

C:\>netstat -s

IPv4 Statistics

Packets Received                = 14494
Received Header Errors          = 0
Received Address Errors        = 22
Datagrams Forwarded             = 0
Unknown Protocols Received     = 0
Received Packets Discarded     = 5670
Received Packets Delivered     = 8823
Output Requests                = 8222
Routing Discards               = 0
Discarded Output Packets       = 48
Output Packet No Route         = 0
Reassembly Required            = 0
Reassembly Successful          = 0
Reassembly Failures            = 0
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
Fragments Created              = 0

ICMPv4 Statistics

Messages      Received      Sent
Errors        0             0
Destination Unreachable 0             0
Time Exceeded 0             0
Parameter Problems 0             0
Source Quenches 0             0
Redirects      0             0
Echos         38            43
Echo Replies   43            38
Timestamps    0             0
Timestamp Replies 0             0
Address Masks 0             0
Address Mask Replies 0             0

TCP Statistics for IPv4

Active Opens                = 250
Passive Opens               = 29
Failed Connection Attempts  = 27
Reset Connections           = 18
Current Connections         = 6
Segments Received           = 7339
Segments Sent               = 7083
Segments Retransmitted      = 14

UDP Statistics for IPv4

Datagrams Received    = 1428
No Ports              = 36
Receive Errors        = 0
Datagrams Sent        = 1037

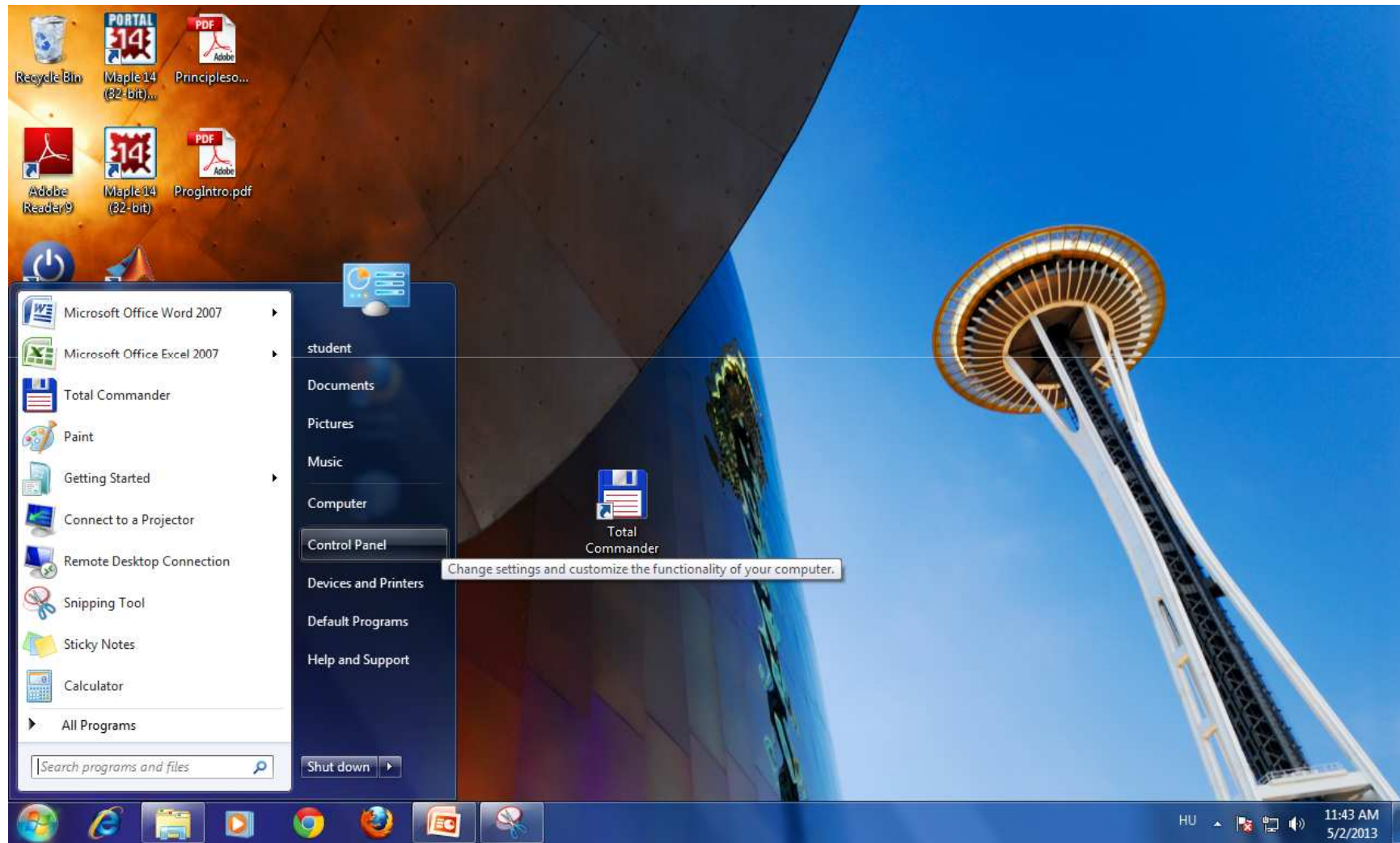
C:\>
```

Internet options

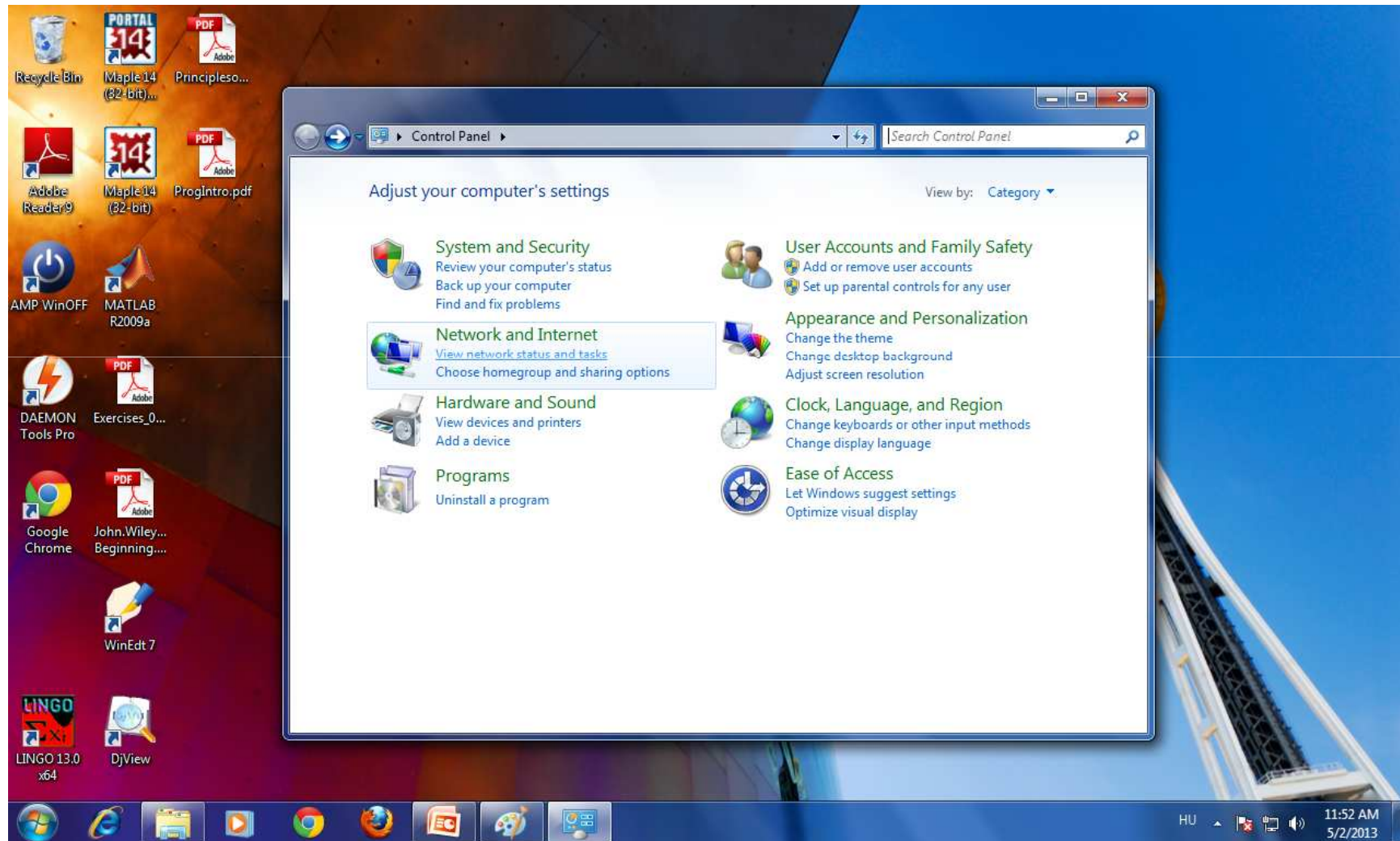
General settings to Internet (web)

- Home page of browser
- Browsing history
- Default browser
- Search setting
- Content advisor
- Proxy
- etc.

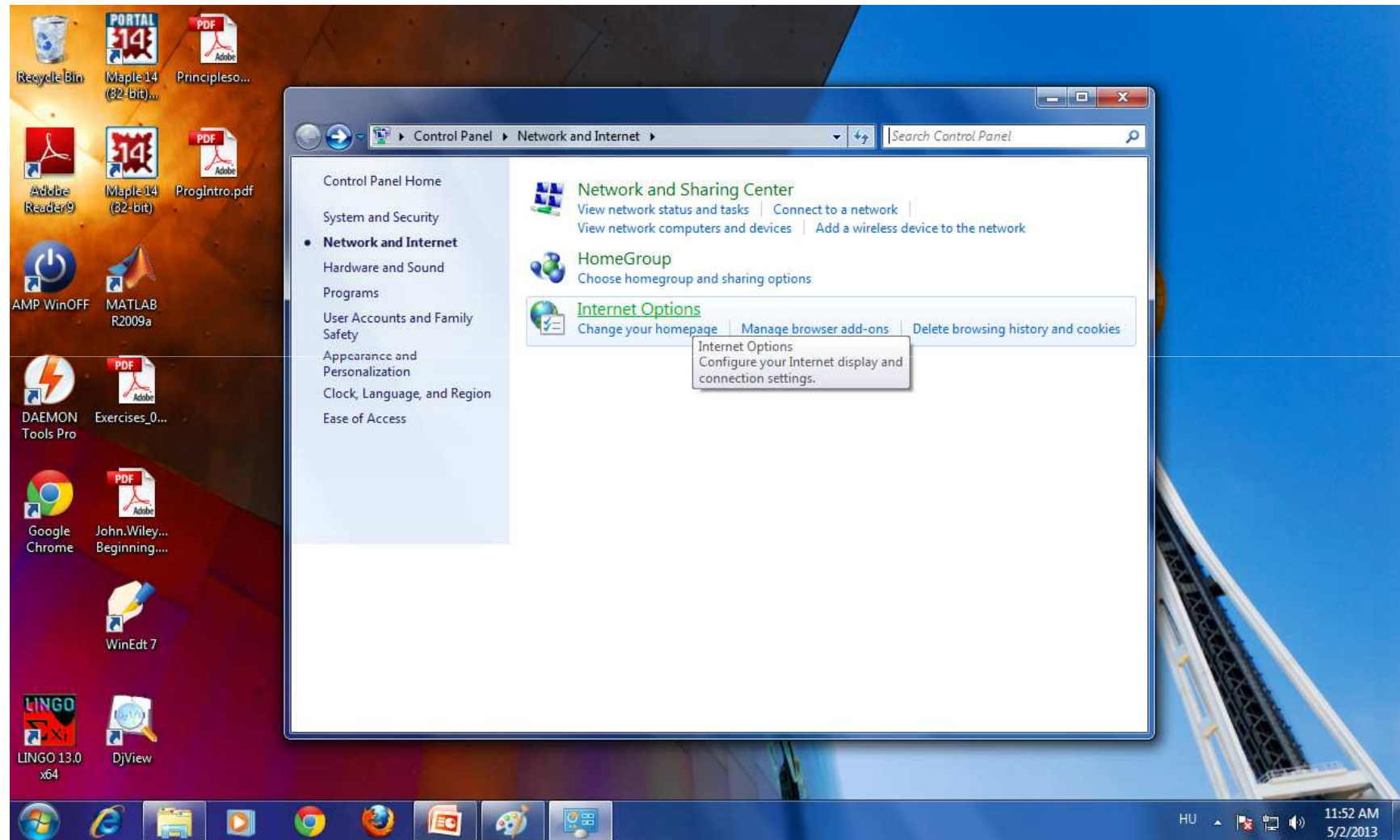
1 Start Menu



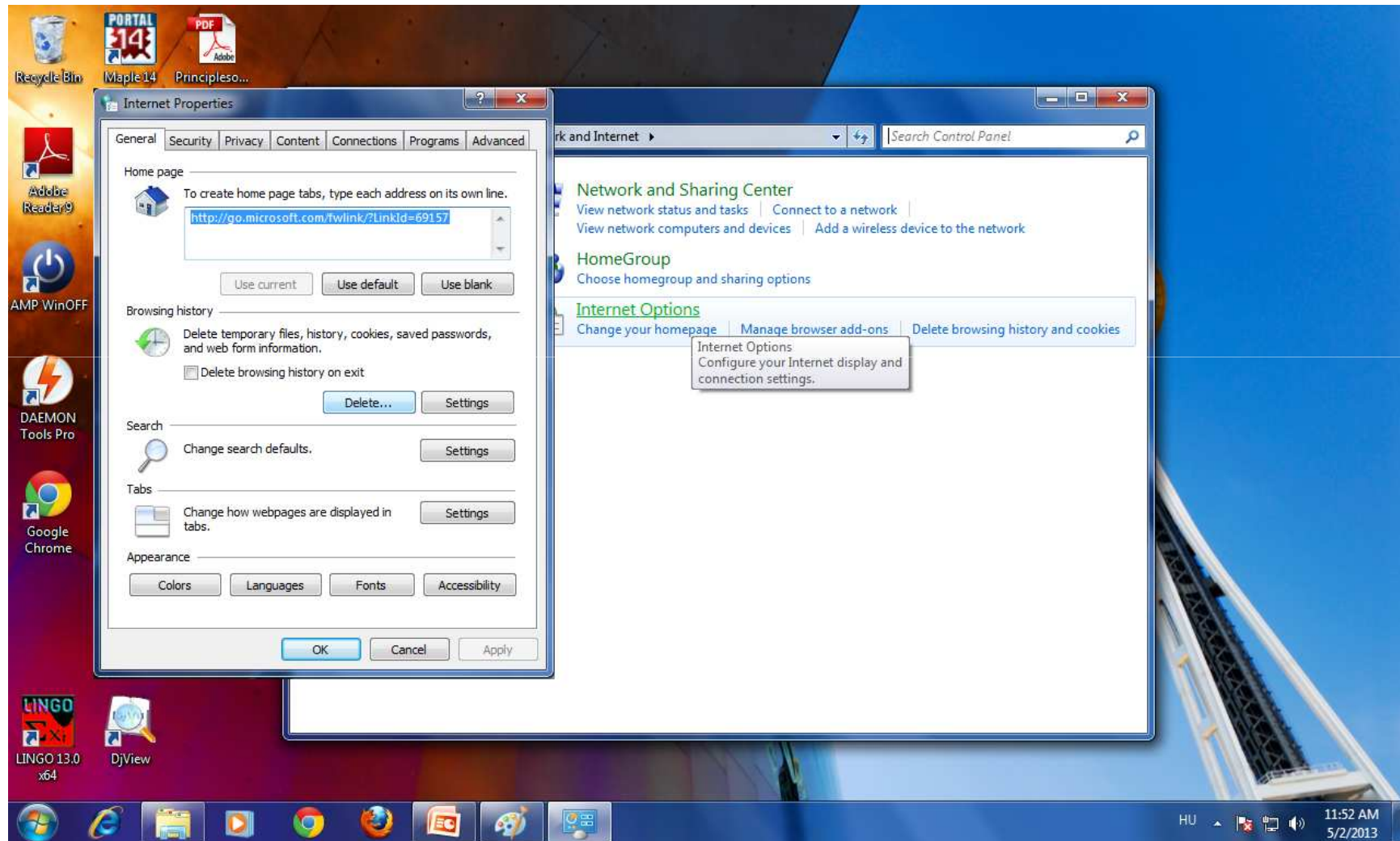
2 Control Panel



3 Network and Internet



4. Internet Options



5 Browsing history

