Golden-Gate Int'l College

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A

Lab Report on

Network Programming

(CACS355)

Submitted by:

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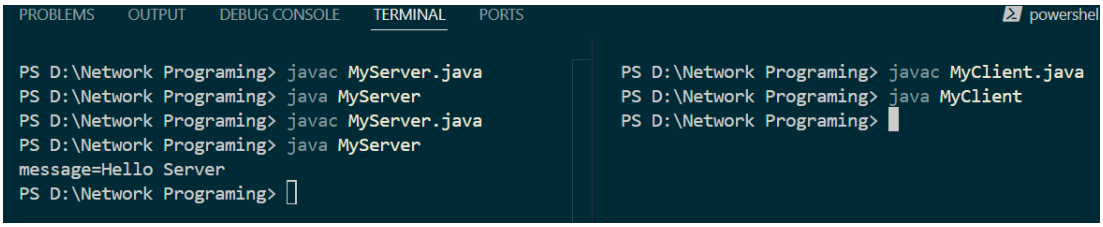
Chapter 1: Introduction

1. Write a program for Client-Server Approach.



Chapter 2: InetAddress

1. Write a program to print the address of www.tufohss.edu.np.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac AddressDemo.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java AddressDemo
www.tufohss.edu.np/202.45.144.31
```

2. Write a program to print the address of the local machine.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac MyAddress.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java MyAddress
Surakshya/192.168.56.1
```

3. Write a program that finds the canonical hostname of the given address.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac ReverseTest.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java ReverseTest
182.91.80.150
```

4. Write a program to find the IP address and hostname of the local machine.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac IPAddressandHostname.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java IPAddressandHostname
My address is 192.168.56.1
Local host name: Surakshya
```

5. Write a program to get IPv4 and IPv6 address of the given web address.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac Inetipv4ipv6Address.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java Inetipv4ipv6Address
Looking up: facebook.com
IPv4 = 163.70.143.35
```

6. Write a program for determining whether an Ip address is IPv4 or IPv6.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac IPAddressTests.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java IPAddressTests
IPv6
```

7. Write a program for testing the characteristics of an IP address.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac IPCharacteristics.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java IPCharacteristics "127.0.0.1"
/127.0.0.1 is a loopback address.
/127.0.0.1 is a global address.
/127.0.0.1 is a unicast address.
```

8. Write a program that compares the domain name are "www.ibiblio.org" and "helios.ibiblio.org" the same?

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac Comparison.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java Comparison
Host lookup failed.
```

9. Write a program that lists all the network interfaces.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac InterfaceLister.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java InterfaceLister
name:ethernet_0 (VirtualBox Host-Only Ethernet Adapter-WFP Native MAC Layer LightWeight Filter-0000)
name:ethernet_1 (VirtualBox Host-Only Ethernet Adapter-QoS Packet Scheduler-0000)
name:ethernet_2 (VirtualBox Host-Only Ethernet Adapter-WFP 802.3 MAC Layer LightWeight Filter-0000)
name:ethernet_3 (Realtek PCIe GbE Family Controller-WFP Native MAC Layer LightWeight Filter-0000)
name:ethernet_4 (Realtek PCIe GbE Family Controller-VirtualBox NDIS Light-Weight Filter-0000)
name:ethernet_5 (Realtek PCIe GbE Family Controller-QoS Packet Scheduler-0000)
name:ethernet_6 (Realtek PCIe GbE Family Controller-WFP 802.3 MAC Layer LightWeight Filter-0000)
name:ethernet_7 (WAN Miniport (IP)-WFP Native MAC Layer LightWeight Filter-0000)
name:ethernet_8 (WAN Miniport (IP)-QoS Packet Scheduler-0000)
name:ethernet_9 (WAN Miniport (IPv6)-WFP Native MAC Layer LightWeight Filter-0000)
name:ethernet_10 (WAN Miniport (IPv6)-QoS Packet Scheduler-0000)
name:ethernet_11 (WAN Miniport (Network Monitor)-WFP Native MAC Layer LightWeight Filter-0000)
name:ethernet_12 (WAN Miniport (Network Monitor)-QoS Packet Scheduler-0000)
name:ethernet_32768 (VirtualBox Host-Only Ethernet Adapter)
name:ethernet_32769 (Realtek PCIe GbE Family Controller)
name:ethernet_32770 (Microsoft Kernel Debug Network Adapter)
name:ethernet_32771 (WAN Miniport (IP))
name:ethernet_32772 (WAN Miniport (IPv6))
name:ethernet_32773 (VirtualBox Host-Only Ethernet Adapter)
name:ethernet_32774 (WAN Miniport (Network Monitor))
name:ethernet_32775 (Bluetooth Device (Personal Area Network))
name:ppp_32768 (WAN Miniport (PPPOE))
name:loopback_0 (Software Loopback Interface 1)
name:wireless_0 (Intel(R) Wi-Fi 6 AX203-WFP Native MAC Layer LightWeight Filter-0000)
name:wireless_1 (Intel(R) Wi-Fi 6 AX203-Virtual WiFi Filter Driver-0000)
name:wireless_2 (Intel(R) Wi-Fi 6 AX203-Native WiFi Filter Driver-0000)
name:wireless_3 (Intel(R) Wi-Fi 6 AX203-VirtualBox NDIS Light-Weight Filter-0000)
name:wireless_4 (Intel(R) Wi-Fi 6 AX203-QoS Packet Scheduler-0000)
name:wireless_5 (Intel(R) Wi-Fi 6 AX203-WFP 802.3 MAC Layer LightWeight Filter-0000)
name:wireless_6 (Microsoft Wi-Fi Direct Virtual Adapter #3-WFP Native MAC Layer LightWeight Filter-0000)
name:wireless_7 (Microsoft Wi-Fi Direct Virtual Adapter #3-Native WiFi Filter Driver-0000)
name:wireless_8 (Microsoft Wi-Fi Direct Virtual Adapter #3-VirtualBox NDIS Light-Weight Filter-0000)
name:wireless_9 (Microsoft Wi-Fi Direct Virtual Adapter #3-QoS Packet Scheduler-0000)
name:wireless_10 (Microsoft Wi-Fi Direct Virtual Adapter #3-WFP 802.3 MAC Layer LightWeight Filter-0000)
name:wireless_11 (Microsoft Wi-Fi Direct Virtual Adapter #4-WFP Native MAC Layer LightWeight Filter-0000)
name:wireless_12 (Microsoft Wi-Fi Direct Virtual Adapter #4-Native WiFi Filter Driver-0000)
name:wireless_13 (Microsoft Wi-Fi Direct Virtual Adapter #4-VirtualBox NDIS Light-Weight Filter-0000)
name:wireless_14 (Microsoft Wi-Fi Direct Virtual Adapter #4-QoS Packet Scheduler-0000)
name:wireless_15 (Microsoft Wi-Fi Direct Virtual Adapter #4-WFP 802.3 MAC Layer LightWeight Filter-0000)
name:wireless_32768 (Intel(R) Wi-Fi 6 AX203)
name:wireless_32769 (Microsoft Wi-Fi Direct Virtual Adapter)
name:wireless_32770 (Microsoft Wi-Fi Direct Virtual Adapter #2)
name:wireless_32771 (Microsoft Wi-Fi Direct Virtual Adapter #3)
name:wireless_32772 (Microsoft Wi-Fi Direct Virtual Adapter #4)
name:tunnel_32512 (Microsoft Teredo Tunneling Adapter)
name:tunnel_32513 (Microsoft IP-HTTPS Platform Adapter)
name:tunnel_32514 (Microsoft 6to4 Adapter)
name:tunnel_32768 (WAN Miniport (SSTP))
name:tunnel_32769 (WAN Miniport (IKEv2))
name:tunnel_32770 (WAN Miniport (L2TP))
name:tunnel_32771 (WAN Miniport (PPTP))
```

10. Write a program that use of network interfaces Getter methods.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac InterfaceGetter.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java InterfaceGetter
Loopback Interface: Software Loopback Interface 1
  IP: 0:0:0:0:0:0:0:1
  IP: 127.0.0.1
```

11. Write a program to check remote system is reachable or not.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac TestingReachability.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java TestingReachability
Success
```

12. Write a program that demonstrate the spam check.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac SpamChecker.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java SpamChecker 1.2.3.4
Checking spam status for: 1.2.3.4
Resolved IP address: 1.2.3.4
Reversed IP for DNSBL: 4.3.2.1
Checking sbl.spamhaus.org... not listed
Checking xbl.spamhaus.org... not listed
Checking pbl.spamhaus.org... not listed
Checking zen.spamhaus.org... not listed
Checking bl.spamcop.net... not listed
Checking dnsbl.sorbs.net... not listed
```

13. Write a program to process web server logfiles.

```
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> javac ServerLogs.java
PS D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 2> java ServerLogs
```

```
 === Processing Summary ===
 Total lines processed: 1500
 Resolved hostnames: 1500
 Unresolved hostnames: 0
```

Chapter 3: URLs and URIs

1. Write a program that splits the parts of a URL [Splitting URL into pieces information]

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java URLSplitter
The URI is https://www.google.com/search?q=image#imgrc=ez-ubljHwN9MSM
The scheme is https
The host is www.google.com
The port is -1
The path is /search
The fragment is imgrc=ez-ubljHwN9MSM
The query is q=image
```

2. Write a program that checks the which protocols does a virtual machine support or not?

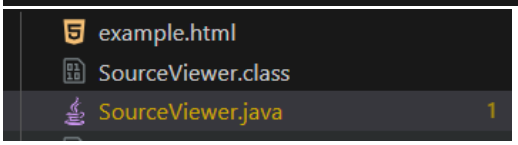
```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac VMProtocolChecker.java
Note: VMProtocolChecker.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java VMProtocolChecker
JVM Protocol Support Checker
==========================
http     : Supported (sun.net.www.protocol.http.HttpURLConnection)
https    : Supported (sun.net.www.protocol.https.HttpsURLConnectionImpl)
ftp      : Supported (sun.net.www.protocol.ftp.FtpURLConnection)
file     : Supported (sun.net.www.protocol.ftp.FtpURLConnection)
mailto   : Supported (sun.net.www.protocol.mailto.MailToURLConnection)
telnet   : Not supported (unknown protocol: telnet)
gopher   : Not supported (unknown protocol: gopher)
jar      : Not supported (no !/ in spec)
ws       : Not supported (unknown protocol: ws)
wss      : Not supported (unknown protocol: wss)
```

3. Write a program to download a web page of a given web address.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac SourceViewer.java
Note: SourceViewer.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java SourceViewer https://www.example.com > example.html
```



4. Write a program for resolving relatives URI.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac ResolveURL.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java ResolveURL
Base URI = https://www.test.org/
Relative URI = languages/../java
Resolved URI = https://www.test.org/java
Normalized URI = https://www.test.org/java
```

5. Write a program to download an object.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac ContentGetter.java
Note: ContentGetter.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java ContentGetter
I got asun.net.www.protocol.http.HttpURLConnection$HttpInputStream
```

6. Write a program to demonstrate the x-www-form-urlencoded strings.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac EncoderTest.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java EncoderTest
This+string+has+spaces
This*string*has*asterisks
This%25string%25has%25percent%25signs
This%2Bstring%2Bhas%2Bpluses
This%2Fstring%2Fhas%2Fslashes
This%22string%22has%22quote%22marks
This%3Astring%3Ahas%3Acolons
This%7Estring%7Ehas%7Etildes
This%28string%29has%28parentheses%29
This.string.has.periods
This%3Dstring%3Dhas%3Dequals%3Dsigns
This%26string%26has%26ampersands
This%C3%A9string%C3%A9has%C3%A9+non-ASCII+characters
This:string:has:colons
```

7. Write a program that communicating with Server-Side Programs Through GET.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>javac DMoz.java
Note: DMoz.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 3>java DMoz
Enter keyword: web
java.net.UnknownHostException: www.dmoz.org
```

Chapter 4: HTTP

1. Write a program that shows a simple CookiePolicy that blocks cookies from .gov domains, but allows others.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 4>javac NoGovernmentCookies.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 4>java NoGovernmentCookies
Should accept example.com cookie: true
Should accept whitehouse.gov cookie: false
Should accept gov cookie on com site: false
```

2. Program to implement the CookieStore Methods (add, read, delete) cookies.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 4>javac CookiesManagerDemo.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 4>java CookiesManagerDemo
Cookies successfully added

Cookies associated with URI in CookieStore: [First="1";$Path="/";$Domain=".ambition.edu.np"]

All Cookies in CookieStore: [First="1";$Path="/";$Domain=".ambition.edu.np", Second="2";$Path="/";$Domain="example.com"]

URIs in CookieStore: [http://www.ambition.edu.np]

Removal of Cookie: true
Remaining Cookies: [Second="2";$Path="/";$Domain="example.com"]

Removal of all Cookies: true
Empty CookieStore: []
```

Chapter 5: URL Connections

1. Write a program to download a web page using URLConnection.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac SourceViewer.java
Note: SourceViewer.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java SourceViewer
```

<!doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="ne"><head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type"><meta content="/images/branding/googleg/1x/googleg_standard_color_128dp.png" itemprop="image"><title>Google</title><script nonce="hi2gBhrKSHtpIOAVa_Lq9Q">(function(){var _g={kEI:'WXn8Z9iLE4TUwPAPgM_OgQU',kEXPI:'0,202792,26,3497491,640,435,552773,71098,354504,226411,20909,42724,5241682,107,32768826,4043709,25228681,112214,26054,18673,3895,56712,6755,23879,9138,3079,1521,328,6225,34311,19879,9975,1346,13702,15635,12132,18244,39237,14214,23170,1819,2893,1212,351,14658,4222,71,6751,2150,756,3858,5773,4311,2064,7107,1427,1743,143,3209,4946,2662,4719,2549,7622,1634,2460,802,458,2531,35,7177,1911,7816,569,2366,3120,657,189,2456,2396,354,1267,3971,445,99,4096,3410,662,7580,345,1707,1738,1739,1157,2425,1449,202,2859,1070,209,303,614,6,90,507,1010,122,717,5,1403,664,1360,131,2,1,2,2,2,3,789,92,2084,1196,223,181,517,314,1259,225,1837,2030,690,257,300,315,39,433,158,3,12,677,4,944,268,249,2,1,2,2,2,548,238,756,1718,145,850,374,290,1162,14,405,568,77,723,19,172,130,118,4,819,627,1,11,2,2,240,497,302,86,7,279,1167,88,44,5,733,2,246,578,85,2,14,44,112,1372,7,39,347,203,4,135,227,14,151,520,12,1,75,7,159,722,2,14,2,16,15,223,58,5,87,195,237,2,209,203,114,486,96,158,4,1274,158,7,3,848,108,180,5,41,1490,472,448,370,4,6,58,17,182,723,29,1223,19,25,1605,104,25,25,2,120,43,94,47,643,9,381,9,642,51,328,45,708,89,8,61,4,114,141,364,24,114,326,170,531,1,1,743,119,260,526,517,3,134,534,846,4,5,21301455,18,4344,196,8,5638,1183,5,4328,115,379,214,4,1503,1118,4,1140,191,881,3,211,2566,6004688,19608,2506200,974',kBL:'oQSJ',kOPI:89978449};(function(){var a;((a=window.google)==null?0:a.stvsc)?google.kEI=_g.kEI:window.google=_g;}).call(this);})();(function(){google.sn='webhp';google.kHL='ne';})();(function(){
var g=this||self;function k(){return window.google&&window.google.kOPI||null};var l,m=[];function n(a){for(var b;a&&(!a.getAttribute||!(b=a.getAttribute("eid")));)a=a.parentNode;return b||l}function p(a){for(var b=null;a&&(!a.getAttribute||!(b=a.getAttribute("leid")));)a=a.parentNode;return b}function q(a){/^http:/i.test(a)&&window.location.protocol==="https:"&&(google.ml&&google.ml(Error("a"),!1,{src:a,glmm:1}),a="");return a}
function r(a,b,d,c,h){var e="";b.search("&ei=")===-1&&(e="&ei="+n(c),b.search("&lei=")===-1&&(c=p(c))&&(e+="&lei="+c));var f=b.search("&cshid=")===-1&&a!=="slh";c="&zx="+Date.now().toString();g._cshid&&f&&(c+="&cshid="+g._cshid);(d=d())&&(c+="&opi="+d);return"/"+(h||"gen_204")+"?atyp=i&ct="+String(a)+"&cad="+(b+e+c)};l=google.kEI;google.getEI=n;google.getLEI=p;google.ml=function(){return null};google.log=function(a,b,d,c,h,e){e=e===void 0?k:e;d||(d=r(a,b,e,c,h));if(d=q(d)){a=new Image;var f=m.length;m[f]=a;a.onerror=a.onload=a.onabort=function(){delete m[f]};a.src=d}};google.logUrl=function(a,b){b=b===void 0?k:b;return r("",a,b)};}).call(this);(function(){google.y={};google.sy=[];var d;(d=google).x||(d.x=function(a,b){if(a)var c=a.id;else{do c=Math.random();while(google.y[c])}google.y[c]=[a,b];return!1});var e;(e=google).sx||(e.sx=function(a){google.sy.push(a)});google.lm=[];var f;(f=google).plm||(f.plm=function(a){google.lm.push.apply(google.lm,a)});google.lq=[];var g;(g=google).load||(g.load=function(a,b,c){google.lq.push([[a],b,c])});var h;(h=google).loadAll||(h.loadAll=function(a,b){google.lq.push([a,b])});google.bx=!1;var k;(k=google).lx||(k.lx=function(){});var l=[],m;(m=google).fce||(m.fce=function(a,b,c,n){1.push([a,b,c,n])});google.qce=1;}).ca
094d\\u092a\\u0937\\u094d\\u091f \\u0916\\u094b\\u091c\\u0940\x22,\x22dym\x22:\x22\\u0915\\u0947 \\u0924\\u092a\\u093e\\u0908\\u0902\\u0932\\u0947 \\u0916\\u094b\\u091c\\u094d\\u0928 \\u0932\\u093e\\u0917\\u094d\\u0928\\u0941\\u092d\\u090f\\u0915\\u094b \\u0915\\u0941\\u0930\\u093e \\u092f\\u094b \\u0939\\u094b:\x22,\x22lcky\x22:\x22\\u092e \\u092d\\u093e\\u0917\\u094d\\u092f\\u092e\\u093e\\u0928\\u0940 \\u0905\\u0928\\u0941\\u092d\\u0942\\u0924\\u093f \\u0917\\u0930\\u093f\\u0930\\u0939\\u0947\\u091b\\u0941\x22,\x22lml\x22:\x22\\u0925\\u092a \\u091c\\u093e\\u0928\\u0915\\u093e\\u0930\\u0940\\u0940\x22,\x22psrc\x22:\x22\\u092f\\u094b \\u0916\\u094b\\u091c\\u0940 \\u003Ca href\x3d\\\x22/history\\\x22\\u003E \\u0924\\u092a\\u093e\\u0908\\u0915\\u094b \\u0935\\u0947\\u092c \\u0907\\u0924\\u093f\\u0939\\u093e\\u0938\\u003C/a\\u003E\\u092c\\u093e\\u091f \\u0939\\u091f\\u093e\\u0907\\u092f\\u094b\x22,\x22psrl\x22:\x22\\u0939\\u091f\\u093e\\u0909\\u0928\\u0941\\u0939\\u094b\\u0938\x22,\x22sbit\x22:\x22\\u091a\\u093f\\u0924\\u094d\\u0930\\u0926\\u094d\\u0935\\u093e\\u0930\\u093e \\u0916\\u094b\\u091c\\u094d\\u0928\\u0941\\u0939\\u094b\\u0938\\u094d\x22,\x22srch\x22:\x22Google \\u0916\\u094b\\u091c\\u0940\x22},\x22ovr\x22:{},\x22pq\x22:\x22\x22,\x22rfs\x22:[],\x22stok\x22:\x22jvobQ4dvN8DhrjCmucKNBKf4Vz0\x22}';google.pmc=JSON.parse(pmc);})();</script> </body></html>

2. Write a program to print the entire HTTP Header.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac AllHeader.java
Note: AllHeader.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java AllHeader
Date: Mon, 14 Apr 2025 08:30:32 GMT
Server: Apache
Location: http://fohss.tu.edu.np/
Content-Length: 231
Keep-Alive: timeout=5, max=10000
Connection: Keep-Alive
Content-Type: text/html; charset=iso-8859-1
```

3. Write a program to read value of HTTP Header fields.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac HeaderViewer.java
Note: HeaderViewer.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java HeaderViewer https://tufohss.edu.np
Content-type: text/html; charset=iso-8859-1
Content-length: 231

All Headers:
Status: [HTTP/1.1 301 Moved Permanently]
Keep-Alive: [timeout=5, max=10000]
Server: [Apache]
Connection: [Keep-Alive]
Content-Length: [231]
Date: [Mon, 14 Apr 2025 08:27:21 GMT]
Location: [http://fohss.tu.edu.np/]
Content-Type: [text/html; charset=iso-8859-1]
```

4. Write a program for HTTP Request Method.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac LastModified.java
Note: LastModified.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java LastModified
https://tufohss.edu.np/ was last modified at Thu Jan 01 05:30:00 NPT 1970
```

5. Write a program to print the URL of a URLConnection to "hafoss.edu.np".

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac URLPrinter.java
Note: URLPrinter.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java URLPrinter
http://www.tufohss.edu.np/
```

6. Write a program to get the time when a URL was last changed.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>javac LastModified2.java
Note: LastModified2.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 5>java LastModified2 https://www.example.com https://www.google.com http://invalid.url
https://www.example.com was last modified at Tue Jan 14 01:56:20 NPT 2025

https://www.google.com was last modified at Thu Jan 01 05:30:00 NPT 1970

http://invalid.url was last modified at Thu Jan 01 05:30:00 NPT 1970
```

Chapter 6: Sockets for Clients

1. Write a program socket to client.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 6>javac ClientChat.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 6>java ClientChat
Server Connected : Socket[addr=/127.0.0.1,port=8888,localport=56009]
hello
Server Message: I am from server. Received: hello
hi. I am Surakshya lama. i need your help
Server Message: I am from server. Received: hi. I am Surakshya lama. i need your help
```

Chapter 7: Sockets for Servers

1. Write a program socket for a server.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 7>javac ServerChat.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 7>java ServerChat
Server waiting for connection...
Client connected: Socket[addr=/127.0.0.1,port=56009,localport=8888]
Client says: hello
Client says: hi. I am Surakshya lama. i need your help
```

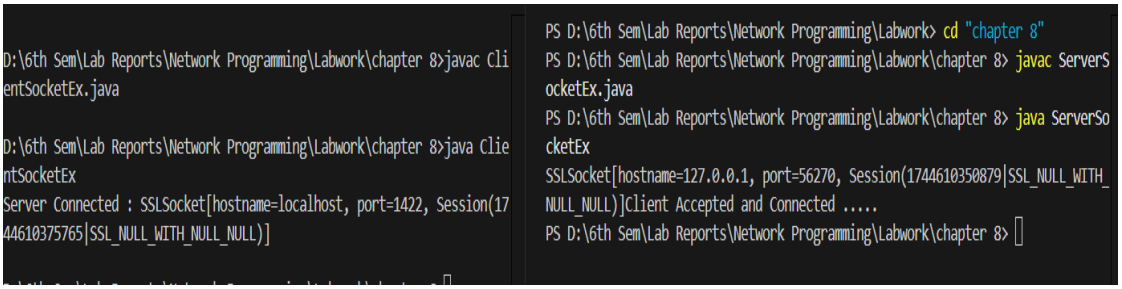
Chapter 8: Secure Sockets

1. Write a program for Creating Secure Sockets with tufohss.edu.np.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 8>javac SecureSocketEx.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 8>java SecureSocketEx
HTTP/1.1 301 Moved Permanently
Date: Mon, 14 Apr 2025 11:01:10 GMT
Server: Apache
Location: http://fohss.tu.edu.np/
Content-Length: 231
Content-Type: text/html; charset=iso-8859-1
```

2. Write a program for Creating Secure Server Sockets and Client Sockets.



Chapter 9: Nonblocking I/O

1. Write program to list all supported socket options for the different types of network channels.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac OptionSupport.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java OptionSupport
SocketChannelImpl supports:
TCP_NODELAY:false
TCP_KEEPCOUNT:10
SO_RCVBUF:65536
SO_SNDBUF:65536
IP_TOS:0
SO_OOBINLINE:false
TCP_KEEPINTERVAL:1
SO_LINGER:-1
SO_KEEPALIVE:false
TCP_KEEPIDLE:7200
SO_REUSEADDR:false

ServerSocketChannelImpl supports:
TCP_KEEPCOUNT:10
SO_RCVBUF:65536
TCP_KEEPINTERVAL:1
TCP_KEEPIDLE:7200
SO_REUSEADDR:false

WindowsAsynchronousSocketChannelImpl supports:
TCP_NODELAY:false
TCP_KEEPCOUNT:10
SO_RCVBUF:65536
SO_SNDBUF:65536
TCP_KEEPINTERVAL:1
SO_KEEPALIVE:false
TCP_KEEPIDLE:7200
SO_REUSEADDR:false
```

```
WindowsAsynchronousServerSocketChannelImpl supports:
TCP_KEEPCOUNT:10
TCP_KEEPINTERVAL:1
SO_RCVBUF:65536
TCP_KEEPIDLE:7200
SO_REUSEADDR:false

DatagramChannelImpl supports:
IP_DONTFRAGMENT:false
SO_RCVBUF:65536
SO_SNDBUF:65536
IP_MULTICAST_TTL:1
IP_TOS:0
SO_BROADCAST:false
IP_MULTICAST_LOOP:true
SO_REUSEADDR:false
IP_MULTICAST_IF:null
```

2. Write program to implement the concept on Filling and Draining buffer, Duplicating buffer, Slicing buffer, Compact buffer.

FillingDraining.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac FillingDraining.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java FillingDraining
H
E
L
L
O
After Cleared
```

DuplicateBufferEx.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac DuplicateBufferEx.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java DuplicateBufferEx
Original ByteBuffer: [20, 30, 40, 50]

Duplicate ByteBuffer: [20, 30, 40, 50]
```

BufferSlicing.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac BufferSlicing.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java BufferSlicing
Original ByteBuffer: [10, 20, 0, 0, 0]
nposition:2

capacity:5

shared subsequence ByteBuffer: [10, 20, 0, 0, 0]
nposition: 0
ncapacity:3
```

BufferCompactEx.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac BufferCompactEx.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java BufferCompactEx
Original ByteBuffer: [20, 30, 40, 0, 0, 0]
Position:3
limit:6
nNew Updated Compacted ByteBuffer: [0, 0, 0, 99, 0, 0]
Position:4
limit: 6
```

3. Write a program to implement the concept on Data Conversion.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>javac DataConversionTest.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 9>java DataConversionTest
Original ByteBuffer:
1020

Byte Value: 10
Next Byte Value: 20

there are fewer than four bytes remaining in this buffer
Exception Thrown :java.nio.BufferUnderflowException
```

Chapter 10: UDP

1. Write a program for UDP Client example.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 10>javac UDPClient.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 10>java UDPClient
hello Server....
FROM SERVER:hello Server....
```

2. Write a program for UDP Server example.

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 10>javac UDPServer.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 10>java UDPServer
RECEIVED: hello Server....
```

Chapter 11: IP Multicasts

1. Program to verify that you are receiving multicast data at a particular host.

   MulticastSocketServer.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>javac MulticastSocketServer.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>java MulticastSocketServer
Server sent packet with msg: Hello every one from server.
```

   MulticastSocketClient.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>javac MulticastSocketClient.java
Note: MulticastSocketClient.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>java MulticastSocketClient
Socket 1 received msg: Hello every one from server.
```

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>javac MulticastSocketClient.java
Note: MulticastSocketClient.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 11>java MulticastSocketClient
Socket 1 received msg: Hello every one from server.
```

Chapter 12: RMI

1. Program to add two numbers using RMI.

   Hello.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>javac Hello.java
```

   ImplExample.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>javac ImplExample.java
```

   ServerRMI.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>javac Server.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>java Server
Server ready
Calculating sum: 5 + 10 = 15
```

   ClientRMI.java

```
D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>javac ClientRMI.java

D:\6th Sem\Lab Reports\Network Programming\Labwork\chapter 12>java ClientRMI
Result from server: 15
```