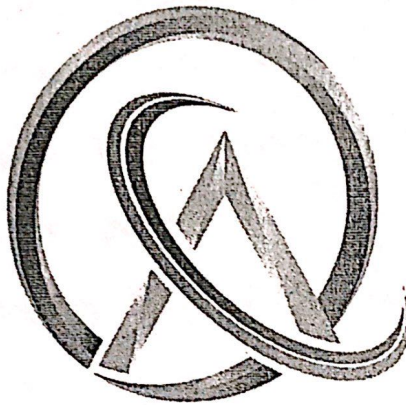


# INSTITUTE OF ENGINEERING

ADVANCED COLLEGE OF ENGINEERING AND MANAGEMENT

KALANKI, KATHMANDU

(AFFILIATED TO TRIBHUVAN UNIVERSITY)



ADVANCED COLLEGE  
OF ENGINEERING & MANAGEMENT



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OF ENGINEERING & MANAGEMENT  
Affiliated to Tribhuvan University (TU)

## LAB REPORT

SUBJECT : Network Programming

LAB NO : 4

### SUBMITTED BY:

NAME : Arish Shrestha

ROLL NO: 1

DATE : 2082/09/30

### SUBMITTED TO:

BCA Department



# TITLE : URL CONNECTIONS

## OBJECTIVES:

- To understand the `URLConnection` class and how it facilitates communication with URL.
- To learn to inspect HTTP headers and retrieve metadata from a server response.
- To practice handling HTTP status codes and request methods.

## THEORY:

### URLConnection

- The `java.net.URLConnection` is an abstract class that represents an active connection to a resource specified by a URL.
- It has two distinct state: connected and not connected.
- Once connected, data can be read from and written to the resource.

### HTTP Header

- HTTP Headers are key-value pairs sent between the client and server during a request or response.
- It contains metadata like Content-Type, Content-Length, Server info etc.



## HTTP Response Code

→ It is a 3-digit integer that indicates the result of the server's attempt to satisfy the request. Common code includes:

- 200 OK:
- 301/302 : Redirection
- 404 NOT FOUND
- 500 INTERNAL SERVER ERROR

## SOURCE CODE:

```
package lab4;  
  
import java.*;  
  
public class Solution {  
    public static void main (String[] args){  
        question1();  
        question2();  
        question3();  
        question4();  
        question5();  
    }  
}
```

//1. to download webpage using URL Connection

```
private static void question1(){
```

```
try{
```

```
URL url = new URL("https://acem.edu.ng/pages/");
```

```
URLConnection uc = url.openConnection();
```

```
try(InputStream is = uc.getInputStream()){
```

```
BufferedReader r = new BufferedReader(new Input-  
StreamReader(is));
```

```
int c;
```

```
int count=0;
```

```
while ((c = r.read()) != -1 && count<5){
```

```
System.out.println((char) c);
```

```
if (c == 'S'){
```

```
System.out.println();
```

```
count++;
```

```
}
```

```
}
```

```
r.close();
```

```
} catch (IOException e){
```

```
System.out.println("e.getMessage());
```

```
}
```

```
}
```

```
"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:D:\downloadssss\Int  
<!DOCTYPE html>  
  
<html lang="en">  
<head>  
<meta charset="UTF-8">  
<meta name="viewport" content="width=device-width, initial-scale=1.0">  
  
Process finished with exit code 0
```



112 to print entire Header Field.

```
private static void question2(){
```

```
try{
```

```
URL url = new URL("https://acem-edu.pnp/pages/");
```

```
URLConnection uc = url.openConnection();
```

```
Map<String, List<String>> headerFields = uc.getHeaderFields();
```

```
headerFields.forEach((k,v) -> {
```

```
    System.out.println(k + " : ");
```

```
    if (v.size() > 1){
```

```
        v.forEach(val -> System.out.print(val + ", "));
```

```
    } else {
```

```
        v.forEach(val -> System.out.print(val));
```

```
    }
```

```
});
```

```
} catch (IOException e){
```

```
    System.out.println(e.getMessage());
```

```
}
```

```
}
```

```
"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:D:\downloadssss\IntelliJ IDI
null : HTTP/1.1 200 OK
Server : nginx
X-Content-Type-Options : nosniff
Connection : keep-alive
X-Mod-Pagespeed : 1.13.35.2-0
Pragma : no-cache
Date : Sun, 11 Jan 2026 12:40:46 GMT
X-Frame-Options : SAMEORIGIN
X-Cache-Status : MISS
Cache-Control : no-store, no-cache, must-revalidate, max-age=0, no-cache,
Vary : Accept-Encoding, User-Agent,
Set-Cookie : PHPSESSID=okoghfrt1411369etcf213hnm6; path=/
Expires : Thu, 19 Nov 1981 08:52:00 GMT
Content-Length : 15268
X-XSS-Protection : 1; mode=block
Content-Type : text/html; charset=UTF-8
X-Powered-By : PHP/8.2.30 ; PleskLin ,

Process finished with exit code 0
```

//3 to print URL of URLConnection

```
private static void question3(){
```

```
try{
```

```
URL url = new URL("https://acem.edu.np/pages/associations-clubs/");
```

```
URLConnection uc = url.openConnection();
```

```
System.out.println("The url is : " + uc.getURL());
```

```
} catch (IOException e){
```

```
System.out.println(e.getMessage());
```

```
}
```

```
}
```

```
"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:D:\downloadsss\Inte
The url is: https://acem.edu.np/pages/associations-clubs/
Process finished with exit code 0
```

//4 to retrieve HTTP response code

```
private static void question4(){
```

```
try{
```

```
URL url = new URL("https://acem.edu.np/pages/");
```

```
HttpURLConnection httpConn = (HttpURLConnection) url.openConnection();
```

```
httpConn.setRequestMethod("POST");
```

```
System.out.println("The response code is : " +  
httpConn.getResponseCode());
```

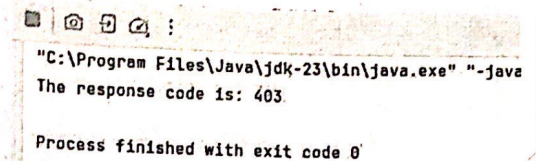
```
}
```



```

    catch (IOException e) {
        System.out.println(e.getMessage());
    }
}

```



```

"C:\Program Files\Java\jdk-23\bin\java.exe" "-java
The response code is: 403
Process finished with exit code 0

```

//5 to get last changed date

```

private static void question5() {

```

```

    try {

```

```

        URL url = new URL("https://example.com");

```

```

        HTTP HttpURLConnection httpConn =

```

```

            (HttpURLConnection) url.openConnection();

```

```

        httpConn.setRequestMethod("HEAD");

```

```

        Date lastModified = new Date(httpConn.getLastModified());

```

```

        System.out.println("The last changed time is: " + lastModified);

```

```

    } catch (IOException e) {

```

```

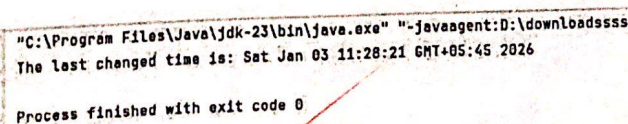
        System.out.println(e.getMessage());
    }
}

```

```

}

```



```

"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:D:\downloadssss
The last changed time is: Sat Jan 03 11:28:21 GMT+05:45 2026
Process finished with exit code 0

```

## CONCLUSION:

In this lab, we successfully utilized the `URLConnection` and `HttpURLConnection` classes to interact with web resources. We learned to extract metadata, check response codes etc.

