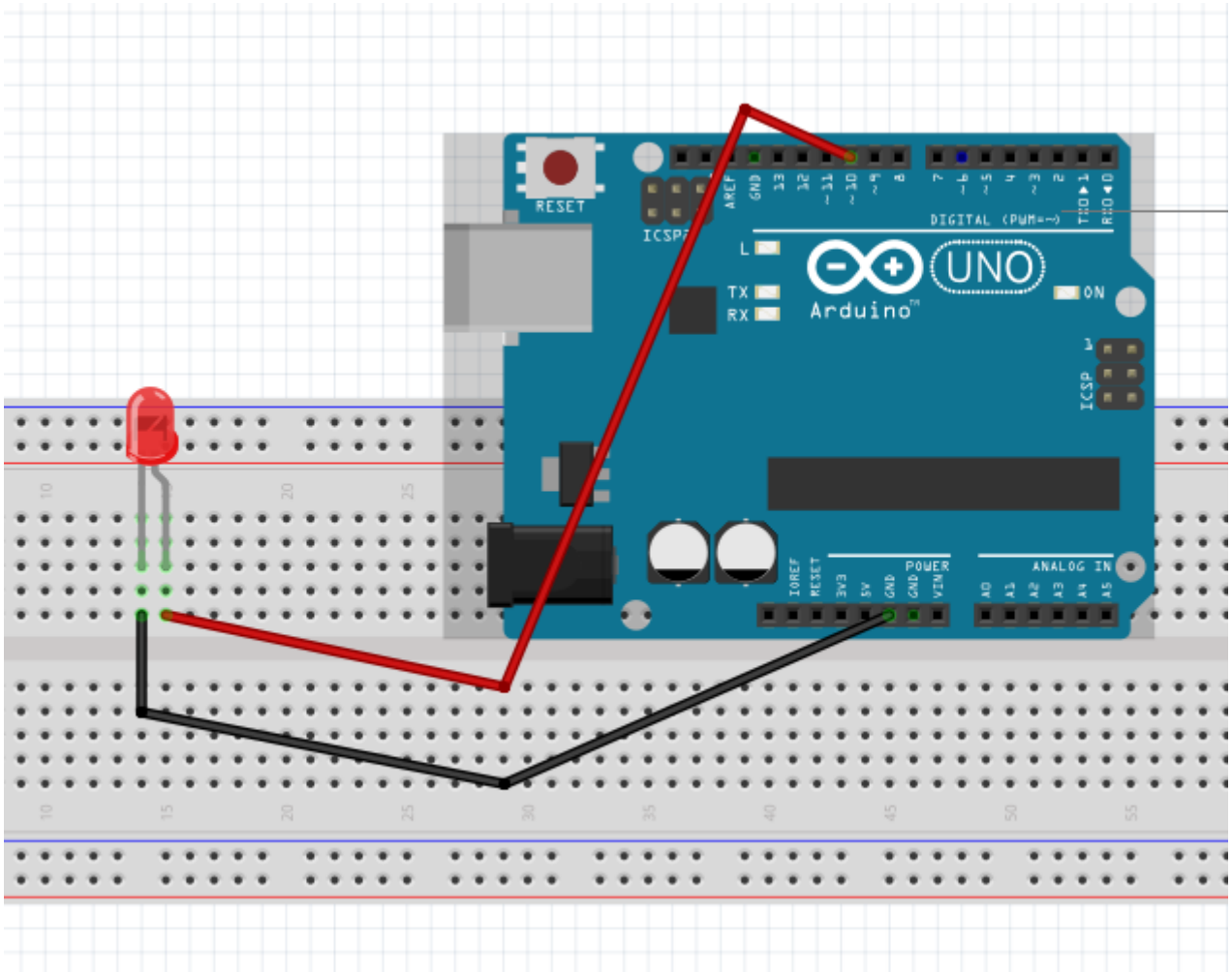
# 아두이노와 웹서버 연동

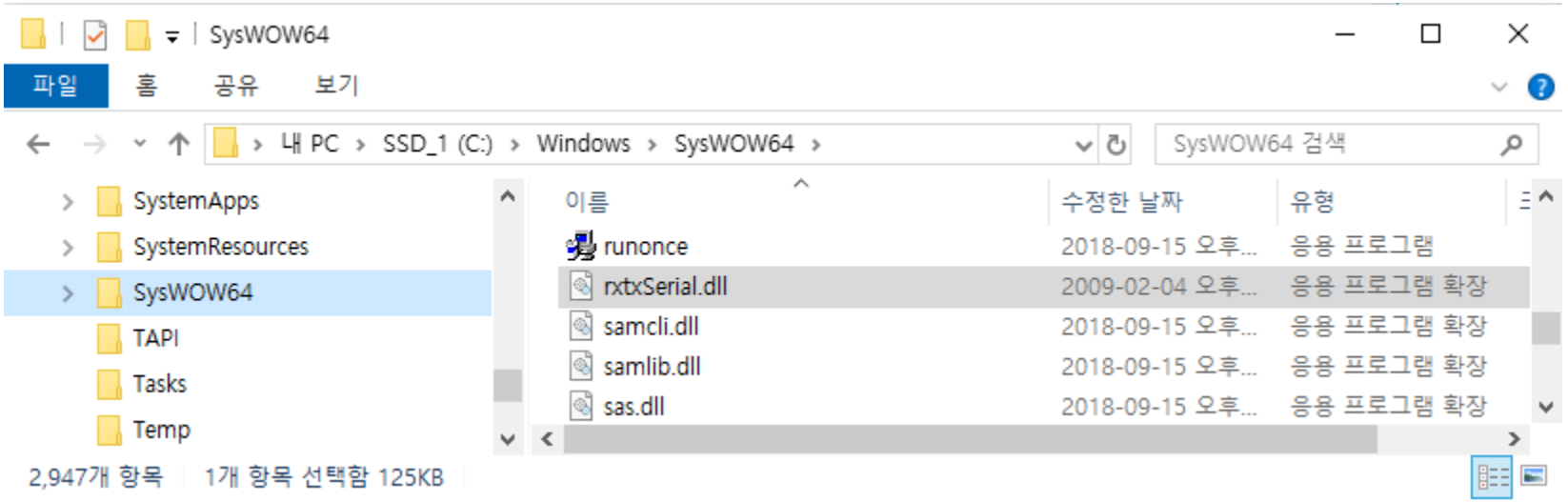
# 아두이노 세팅


RESET
ICSP
DIGITAL (PWM=~)
L
TX
RX
UNO
Arduino
ON
ICSP
POWER
ANALOG IN

# 아두이노 코딩


Serial | 아두이노 1.6.7
파일 편집 스케치 툴 도움말
Serial §
1 void setup() {
2 // put your setup code here, to run once:
3 Serial.begin(9600);
4 pinMode(10, OUTPUT);
5 }
6
7 void loop() {
8 Serial.print(1);
9 int a = Serial.read();
10 delay(1000);
11 if(a==1){
12 digitalWrite(10,HIGH);
13 delay(1000);
14 digitalWrite(10,LOW);
15 }
16 }
17

# rxtxSerial.dll 추가




경로 →
C:₩Windows₩SysWOW64₩rxtxSerial.dll

윈도우 10 64bit 경로

# PC - 이클립스

프로젝트생성
(JAVA Project)

Main.java coding

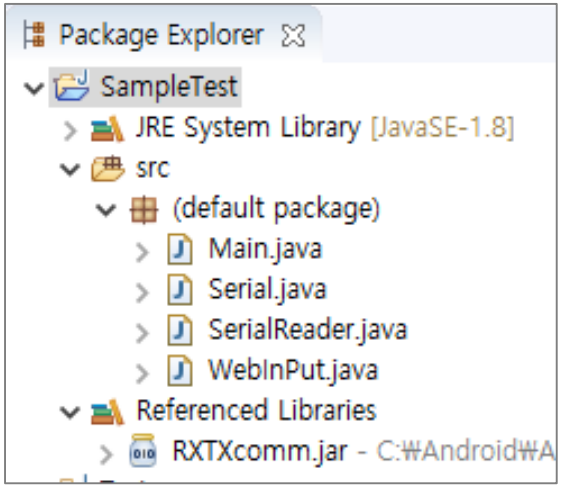
server.jsp coding

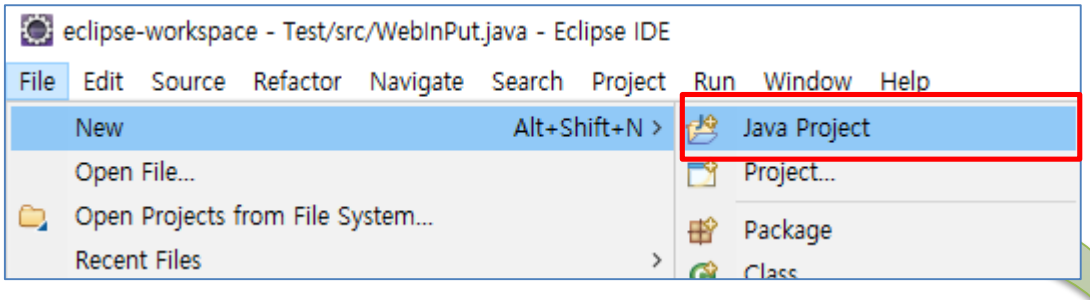
168.126.146.39 서버
학번/server.jsp
에 저장

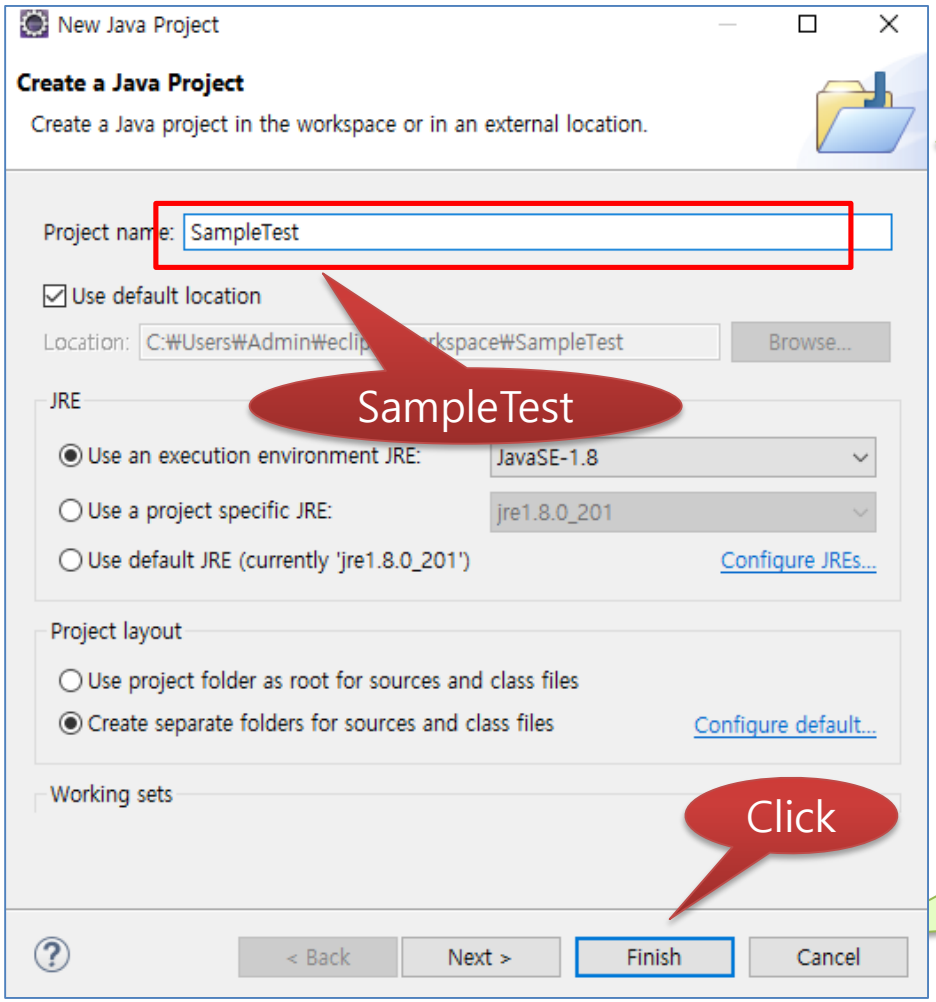
Serial.java coding

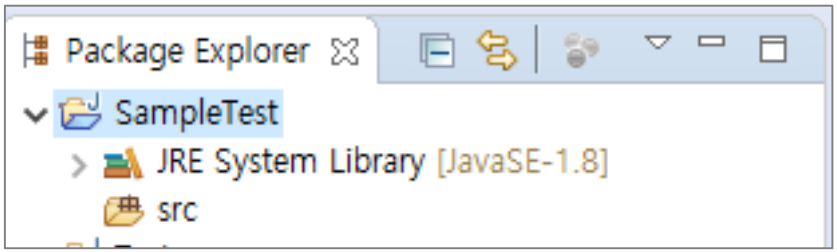
SerialReader.java
coding

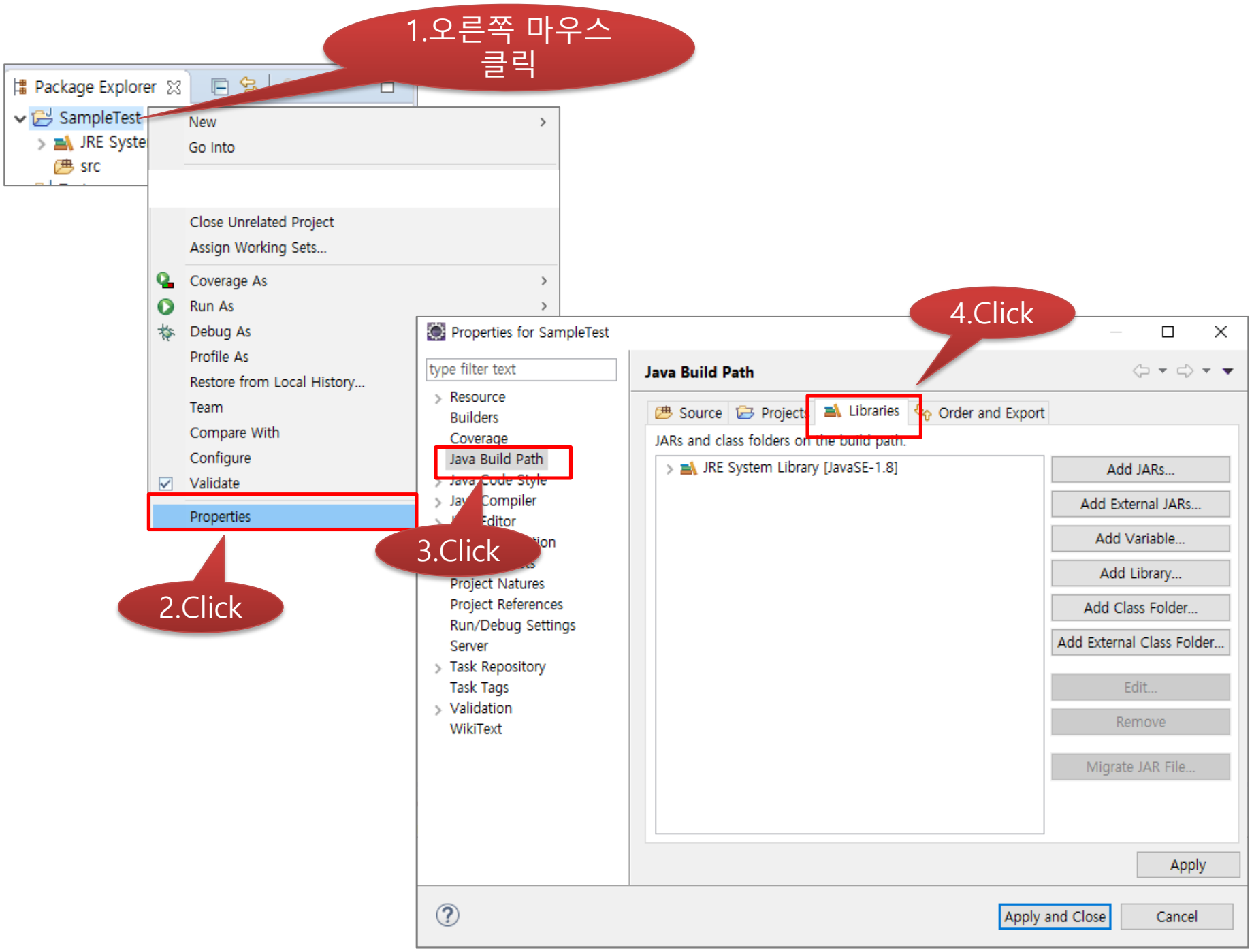
WebInPut.java
coding

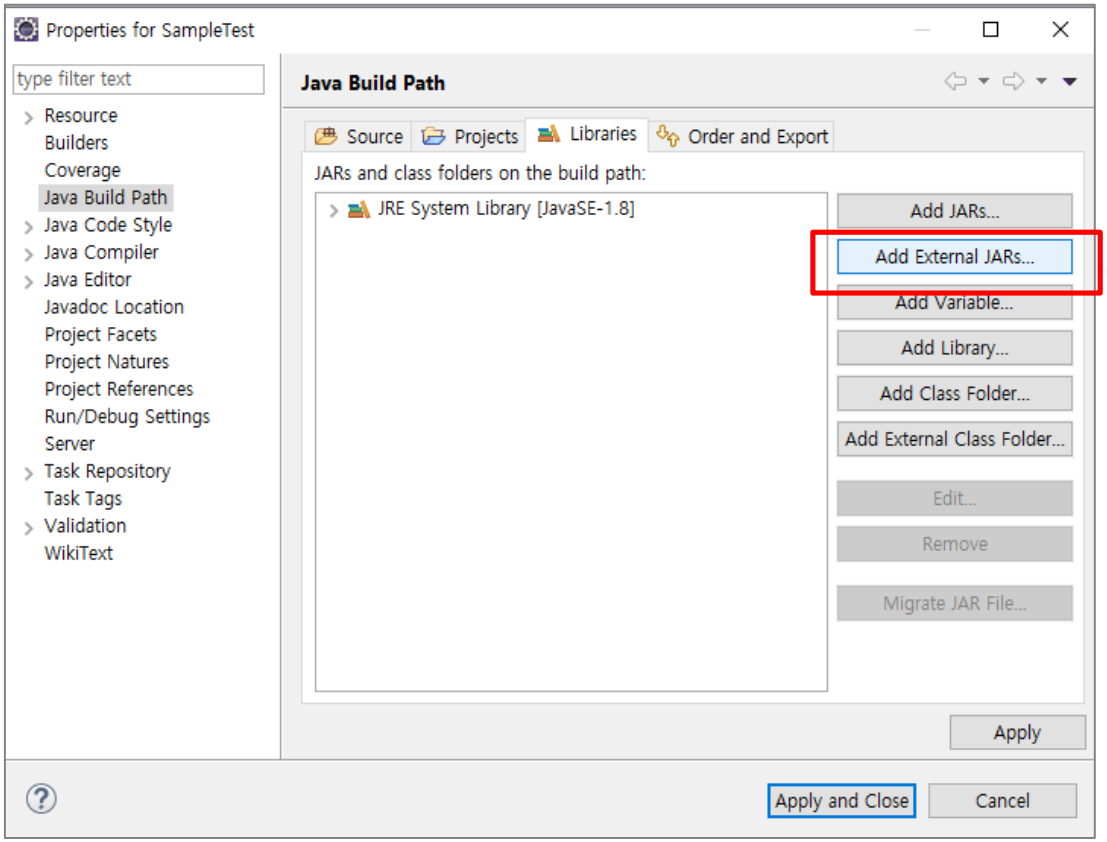



eclipse-workspace - Test/src/WebInPut.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
New Alt+Shift+N >
Open File...
Open Projects from File System...
Recent Files
Java Project
Project...
Package
Class


New Java Project
Create a Java Project
Create a Java project in the workspace or in an external location.
Project name: SampleTest
Use default location
Location: C:₩Users₩Admin₩eclip rkspace₩SampleTest
Browse...
SampleTest
JRE
Use an execution environment JRE: JavaSE-1.8
Use a project specific JRE: jre1.8.0_201
Use default JRE (currently 'jre1.8.0_201')
Configure JREs...
Project layout
Use project folder as root for sources and class files
Create separate folders for sources and class files
Configure default...
Working sets
Click
< Back
Next >
Finish
Cancel

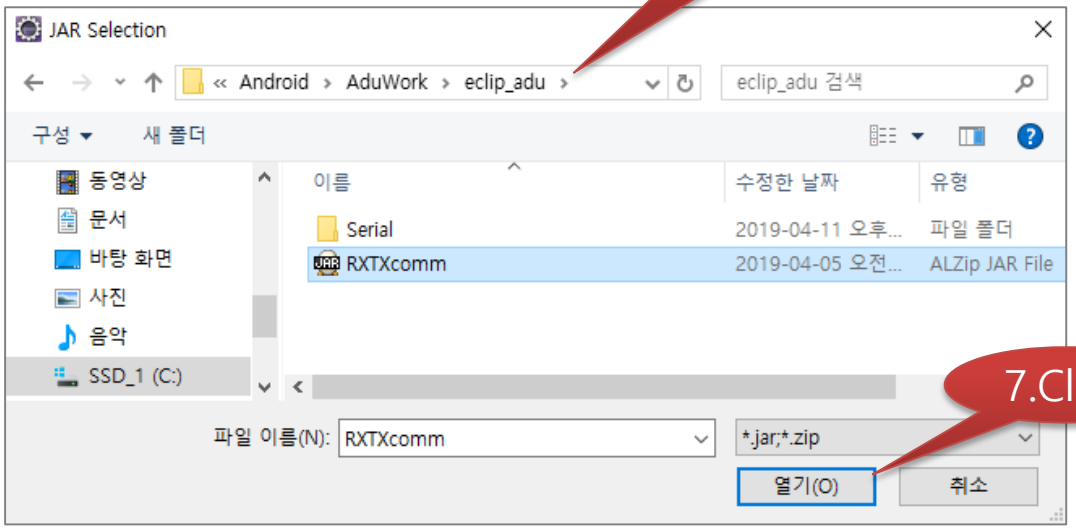

Package Explorer
SampleTest
JRE System Library [JavaSE-1.8]
src


1.오른쪽 마우스 클릭
Package Explorer
SampleTest
JRE Syste
src
New
Go Into
Close Unrelated Project
Assign Working Sets...
Coverage As
Run As
Debug As
Profile As
Restore from Local History...
Team
Compare With
Configure
Validate
Properties
2.Click
3.Click
4.Click
Properties for SampleTest
type filter text
Resource
Builders
Coverage
Java Build Path
Project Natures
Project References
Run/Debug Settings
Server
Task Repository
Task Tags
Validation
WikiText
Java Build Path
Source
Projects
Libraries
Order and Export
JARs and class folders on the build path:
JRE System Library [JavaSE-1.8]
Add JARs...
Add External JARs...
Add Variable...
Add Library...
Add Class Folder...
Add External Class Folder...
Edit...
Remove
Migrate JAR File...
Apply
Apply and Close
Cancel

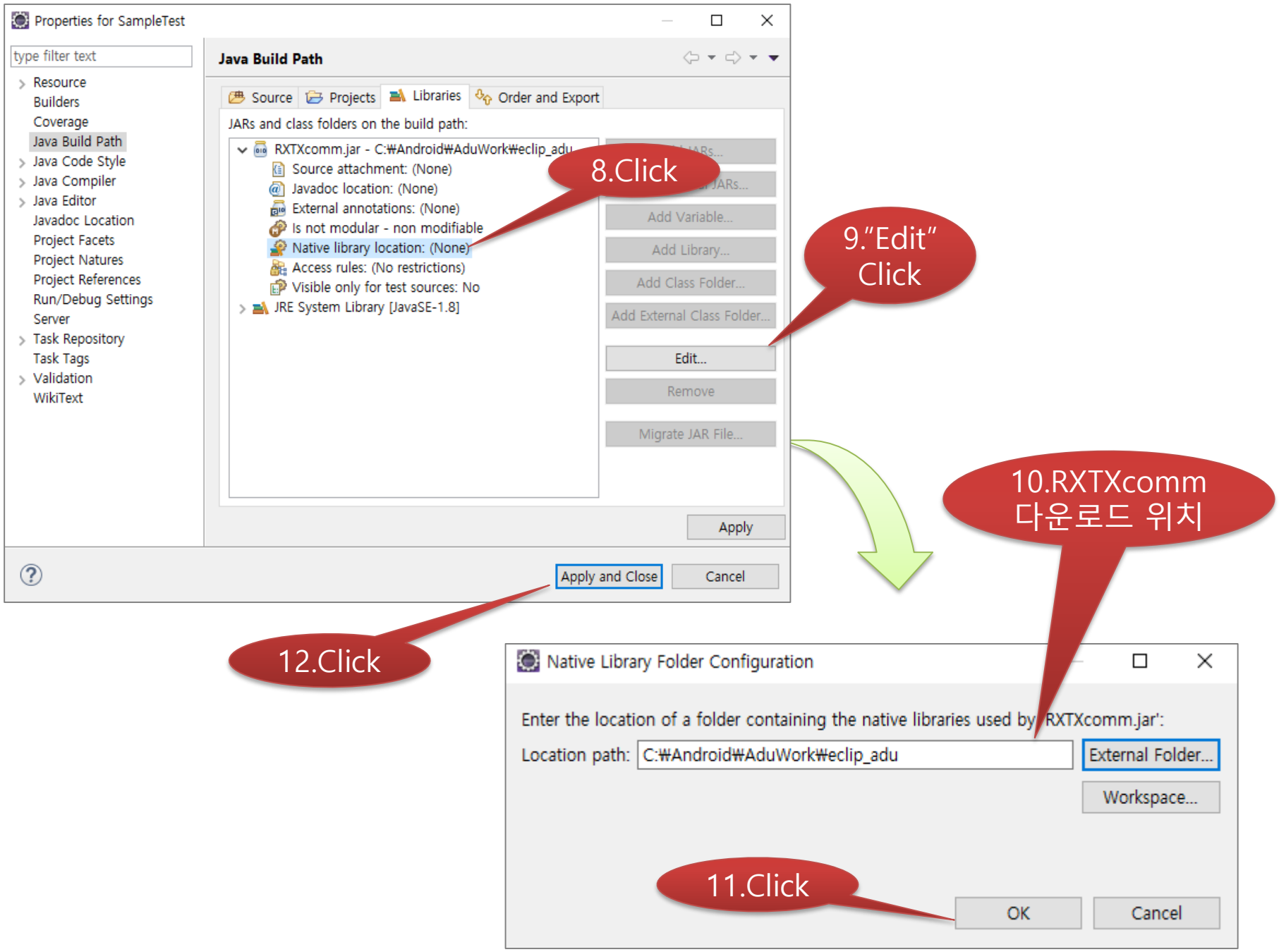


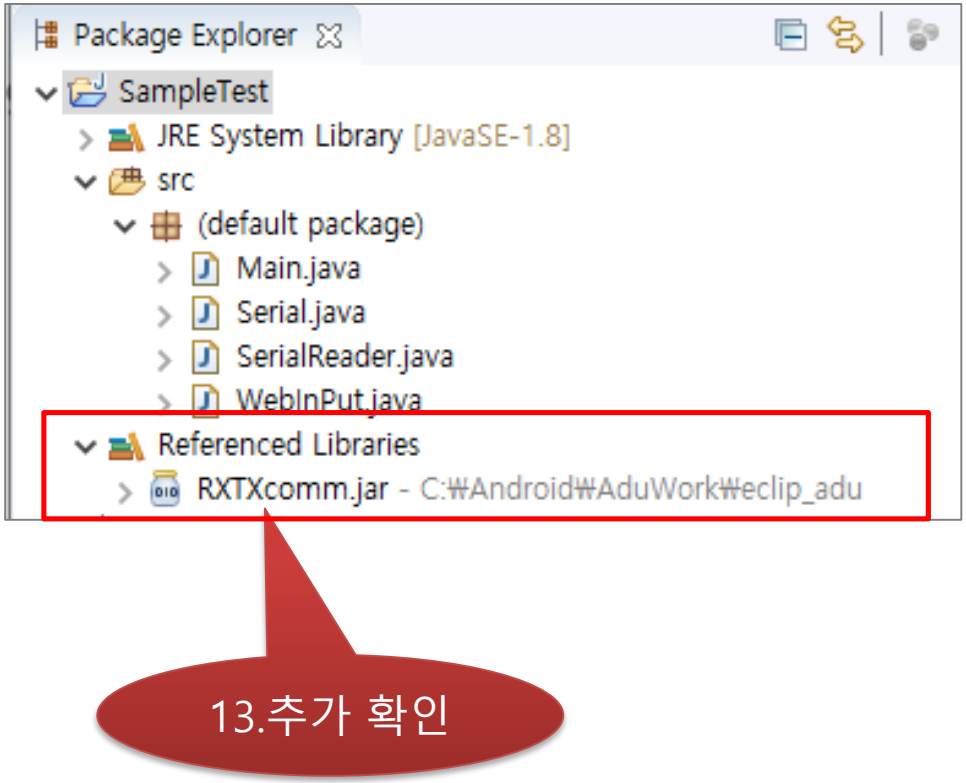

5.Click

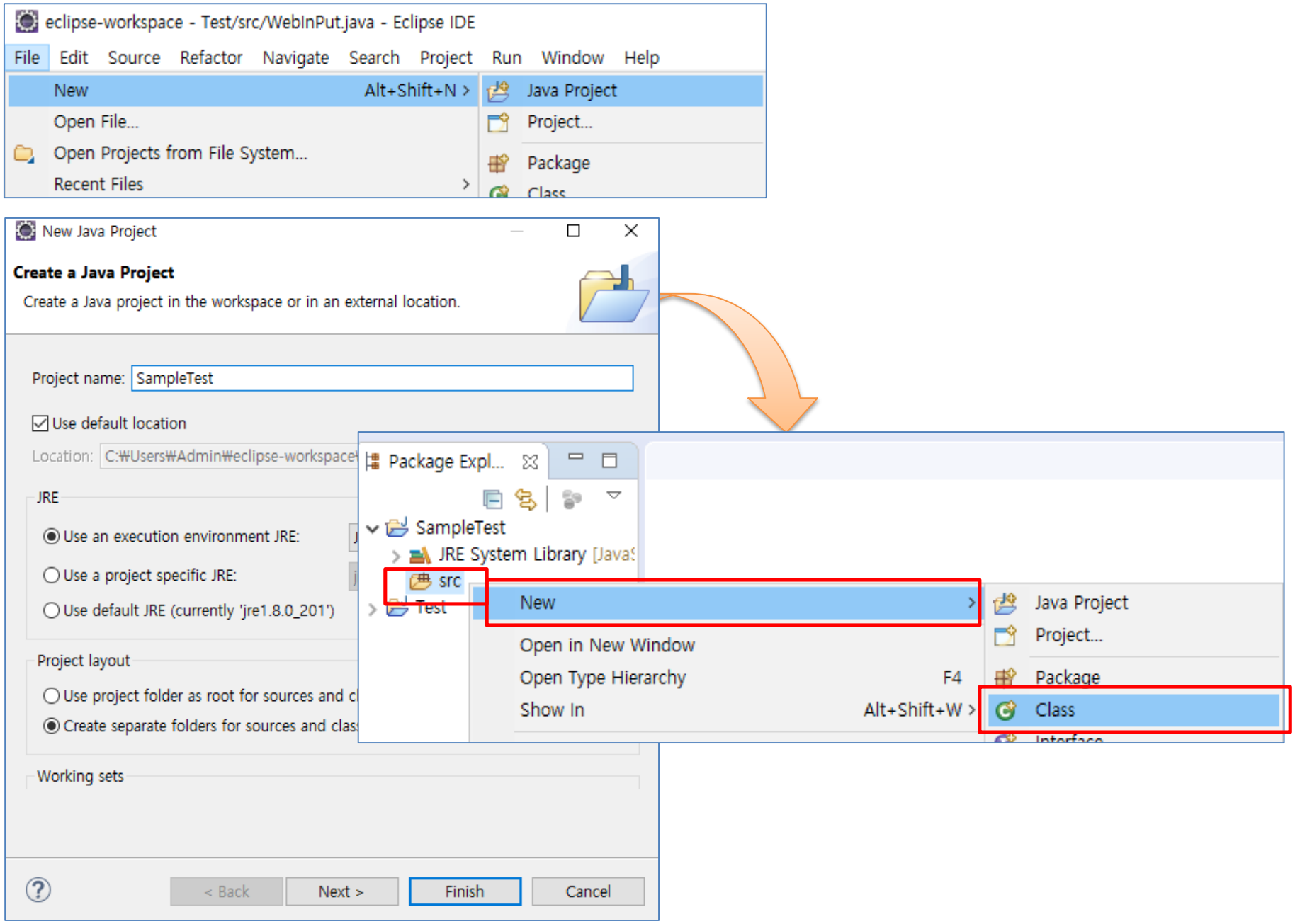
6.RXTXcomm
다운로드 위치

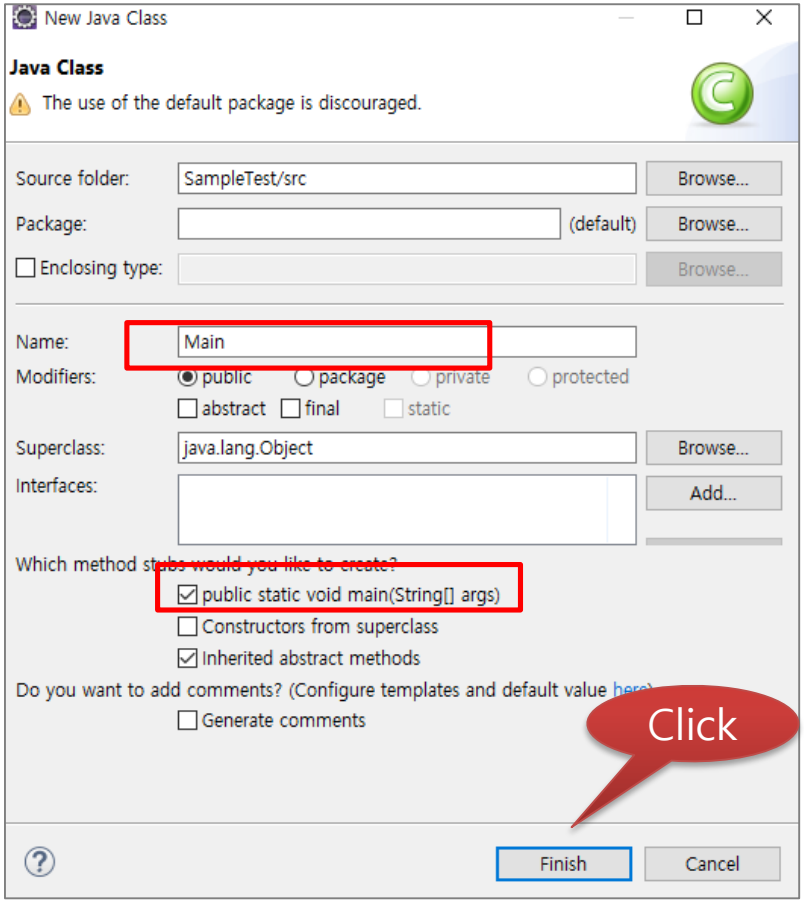



7.Click


Properties for SampleTest
type filter text
Resource
Builders
Coverage
Java Build Path
Java Code Style
Java Compiler
Java Editor
Javadoc Location
Project Facets
Project Natures
Project References
Run/Debug Settings
Server
Task Repository
Task Tags
Validation
WikiText
Java Build Path
Source
Projects
Libraries
Order and Export
JARs and class folders on the build path:
RXTXcomm.jar - C:₩Android₩AduWork₩eclip_adu
Source attachment: (None)
Javadoc location: (None)
External annotations: (None)
Is not modular - non modifiable
Native library location: (None)
Access rules: (No restrictions)
Visible only for test sources: No
JRE System Library [JavaSE-1.8]
Add Variable...
Add Library...
Add Class Folder...
Add External Class Folder...
Edit...
Remove
Migrate JAR File...
Apply
Apply and Close
Cancel
8.Click
9."Edit" Click
10.RXTXcomm 다운로드 위치
12.Click
Native Library Folder Configuration
Enter the location of a folder containing the native libraries used by 'RXTXcomm.jar':
Location path:
C:₩Android₩AduWork₩eclip_adu
External Folder...
Workspace...
11.Click
OK
Cancel


Package Explorer
SampleTest
JRE System Library [JavaSE-1.8]
src
(default package)
Main.java
Serial.java
SerialReader.java
WebInPut.java
Referenced Libraries
RXTXcomm.jar - C:₩Android₩AduWork₩eclip_adu
13.추가 확인

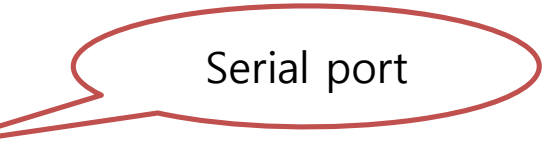

eclipse-workspace - Test/src/WebInPut.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
New Alt+Shift+N >
Open File...
Open Projects from File System...
Recent Files
Java Project
Project...
Package
Class
New Java Project
Create a Java Project
Create a Java project in the workspace or in an external location.
Project name: SampleTest
Use default location
Location: C:₩Users₩Admin₩eclipse-workspace
JRE
Use an execution environment JRE:
Use a project specific JRE:
Use default JRE (currently 'jre1.8.0_201')
Project layout
Use project folder as root for sources and c
Create separate folders for sources and clas
Working sets
< Back
Next >
Finish
Cancel
Package Expl...
SampleTest
JRE System Library [Java
src
Test
New
Open in New Window
Open Type Hierarchy F4
Show In Alt+Shift+W >
Java Project
Project...
Package
Class


New Java Class
Java Class
The use of the default package is discouraged.
Source folder:
SampleTest/src
Browse...
Package:
(default)
Browse...
Enclosing type:
Browse...
Name:
Main
Modifiers:
public
package
private
protected
abstract
final
static
Superclass:
java.lang.Object
Browse...
Interfaces:
Add...
Which method stubs would you like to create?
public static void main(String[] args)
Constructors from superclass
Inherited abstract methods
Do you want to add comments? (Configure templates and default value here)
Generate comments
Click
Finish
Cancel

# Main.java

Main.java

```
1
2  public class Main {
3
4      public static void main(String[] args) {
5
6          try {
7              (new Serial()).connect("COM4");
8          } catch (Exception e) {
9              e.printStackTrace();
10         }
11
12     }
13 }
```



# Serial.java

Serial.java

```
1  import java.io.InputStream;
2  import java.io.OutputStream;
3  import java.net.URL;
4
5  import gnu.io.CommPort;
6  import gnu.io.CommPortIdentifier;
7  import gnu.io.SerialPort;
8
9  public class Serial {
10     WebInPut client = null;
11     public Serial() {
12         super();
13     }
14
15     void connect(String portName) throws Exception {
16         CommPortIdentifier portIdentifier = CommPortIdentifier.getPortIdentifier(portName);
17         if (portIdentifier.isCurrentlyOwned()) {
18             System.out.println("Error: Port is currently in use");
19         } else {
20             CommPort commPort = portIdentifier.open(this.getClass().getName(), 2000);
21
22             if (commPort instanceof SerialPort) {
23                 SerialPort serialPort = (SerialPort) commPort;
24                 serialPort.setSerialPortParams(9600, SerialPort.DATABITS_8, SerialPort.STOPBITS_1,
25                         SerialPort.PARITY_NONE);
26
```

# Serial.java

Web Server Address

```
26
27                  InputStream in = serialPort.getInputStream();
28                  OutputStream out = serialPort.getOutputStream();
29
30                  client = new WebInPut();
31                  URL url = new URL("http://168.126.146.39:8080/egu/server.jsp");
32                  client.init(url, out);
33
34                  (new Thread(new SerialReader(in, client))).start();
35
36              } else {
37                  System.out.println("Error: Only serial ports are handled by this example.");
38              }
39          }
40      }
41  }
42
```

# SerialReader.java

SerialReader.java

```
1  import java.io.IOException;
2  import java.io.InputStream;
3
4  public class SerialReader implements Runnable  {
5      InputStream in;
6      public static String Data = "";
7      WebInPut client = null;
8      public SerialReader(InputStream in, WebInPut _client) {
9          this.in = in;
10         this.client = _client;
11     }
12     public void run() {
13         byte[] buffer = new byte[1024];
14         int len = -1;
15
```

# SerialReader.java

*SerialReader.java

```
15
16          try {
17
18              while ((len = this.in.read(buffer)) > -1) {
19                   System.out.print(new String(buffer, 0, len));
20                  String iaa = new String(buffer, 0, len);
21                  if(iaa.equals("1")) {
22                      System.out.print("1--");
23                      Data = iaa;
24                      System.out.println(Data);
25                       client.sendData( Data);
26                  }
27              }
28          } catch (IOException e) {
29              e.printStackTrace();
30          }
31      }
32  }
```

Arduino Read data

Arduino Read Data를 Web Server로 전송

WebInPut.java

```java
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.OutputStreamWriter;
import java.net.MalformedURLException;
import java.net.URL;
import java.net.URLConnection;
import java.net.URLEncoder;


public class WebInPut{

    public int inData = 0;
    public int outData = 0;
    public URL url;
    public boolean isInit = false;
    public OutputStream out = null;

    public void init(URL _url, OutputStream _out){
        this.isInit = true;
        this.url = _url;
        this.out = _out;
    }
```

WebInPut.java

```
25    public void sendData( String reqData)throws MalformedURLException {
26
27
28        try {
29            if(!isInit)
30            {
31                return;
32            }
33
34            URLConnection urlConn = null;
35            OutputStreamWriter osw = null;
36            BufferedReader br = null;
37            String resData = null;
38
39            urlConn = url.openConnection();
40            urlConn.setDoOutput(true);
41
42            osw = new OutputStreamWriter(urlConn.getOutputStream());
43            System.out.println("indata-"+reqData);
44            reqData = URLEncoder.encode("msg","UTF-8") + "="
45                    + URLEncoder.encode(reqData,"UTF-8");
46            osw.write(reqData);
47            osw.flush();
48            String result = "";
49            br = new BufferedReader(new InputStreamReader(urlConn.getInputStream()));
50            while((resData = br.readLine()) != null) {
51                result += resData;
52            }
```

Web Server 로 전송

Web Server data 받기

# WebInPut.java

WebInPut.java

```
52                  }
53
54                  System.out.println("web_output:"+result);
55
56                  osw.close();
57                  br.close();
58
59                  out.write(Integer.parseInt(result));
60
61
62              }catch (IOException e) {
63                  e.printStackTrace();
64              }
65          }
66
67  }
68
```

Web Server data를 Arduino 로 보내기

# server.jsp

```
<%@ page language="java" contentType="text/html; charset=EUC-KR"
    pageEncoding="EUC-KR"%>
<% String recvMessage = request.getParameter("msg");
   out.println(recvMessage);
   %>
```

# 실행

Problems @ Javadoc Declaration Console

Main (1) [Java Application] C:₩Program Files₩Java₩jre1.8.0_201₩bin₩javaw.exe (2019. 4. 11. 오후 7:20:57)

```
web_output:1
11--1
indata-1
web_output:1
11--1
```

이클립스