

練習 開發環境建置

鄭安翔

ansel_cheng@hotmail.com

練習一

1) 課程開發及執行環境

- ❑ 安裝 **Java SDK**
- ❑ 安裝 **NetBeans IDE**
- ❑ 安裝 **Tomcat**
- ❑ **NetBeans 管理 Tomcat**

安裝 Java SDK

■ Java SDK下載

- <https://www.oracle.com/tw/java/technologies/javase-downloads.html> 下載
- jdk-11.0.x_windows-x64_bin.exe

■ 安裝Java SDK

- 執行 jdk-11.0.x_windows-x64_bin.exe

安裝 Java SDK

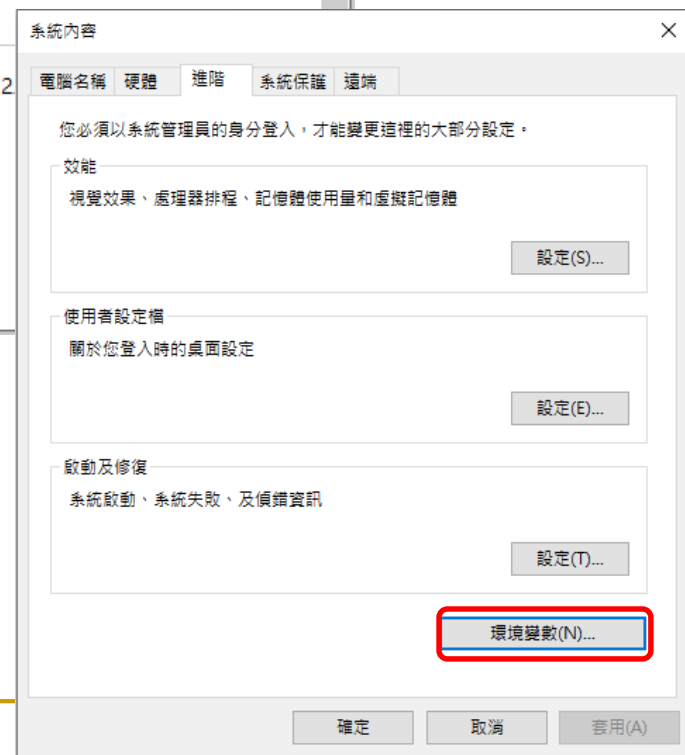
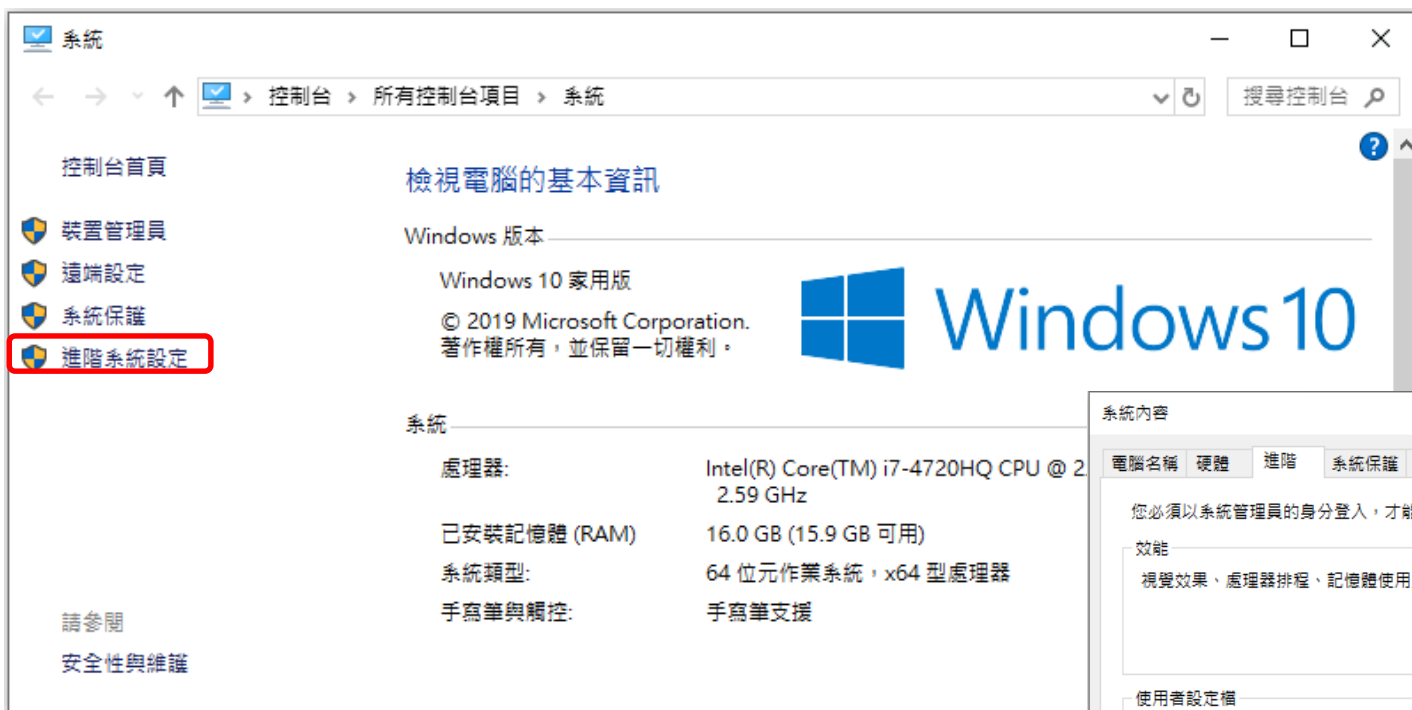
■ 環境變數設定

- Windows 【控制台>系統及安全性>系統>進階系統設定】的【環境變數】項目
- 新增 JAVA_HOME = [Java SDK Location]
 - JAVA_HOME = C:\Program Files\Java\jdk-*X.Y.Z*
- 編輯 PATH 加入
 - *%JAVA_HOME%\bin*;

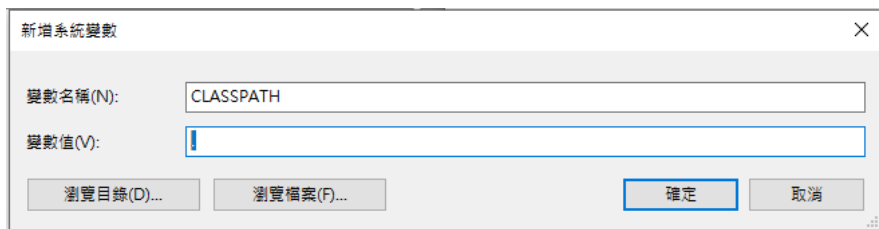
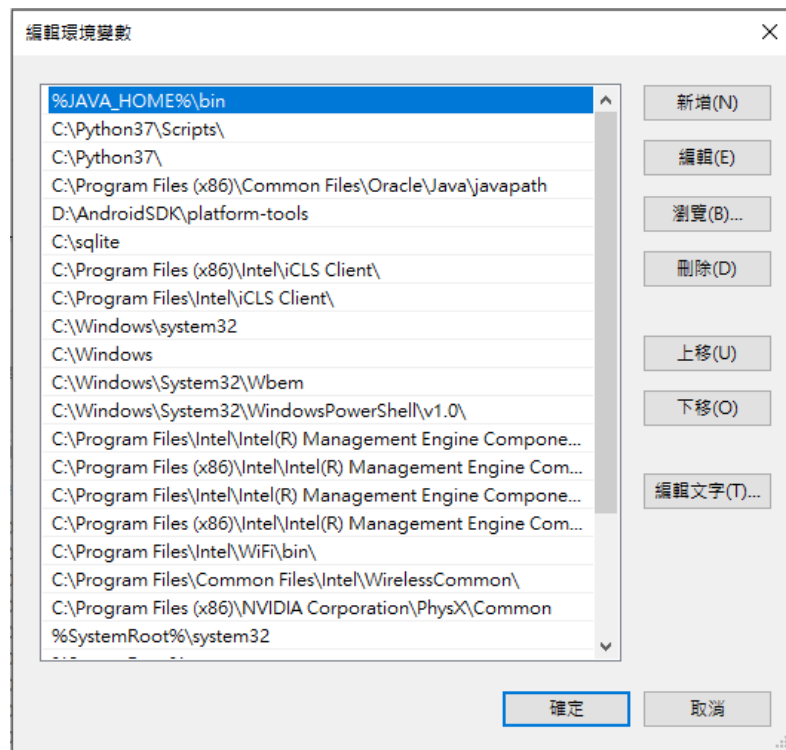
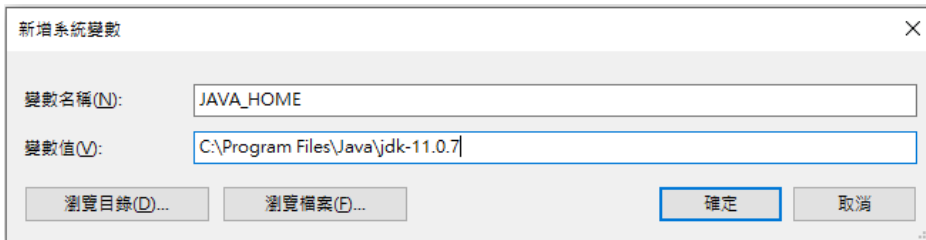
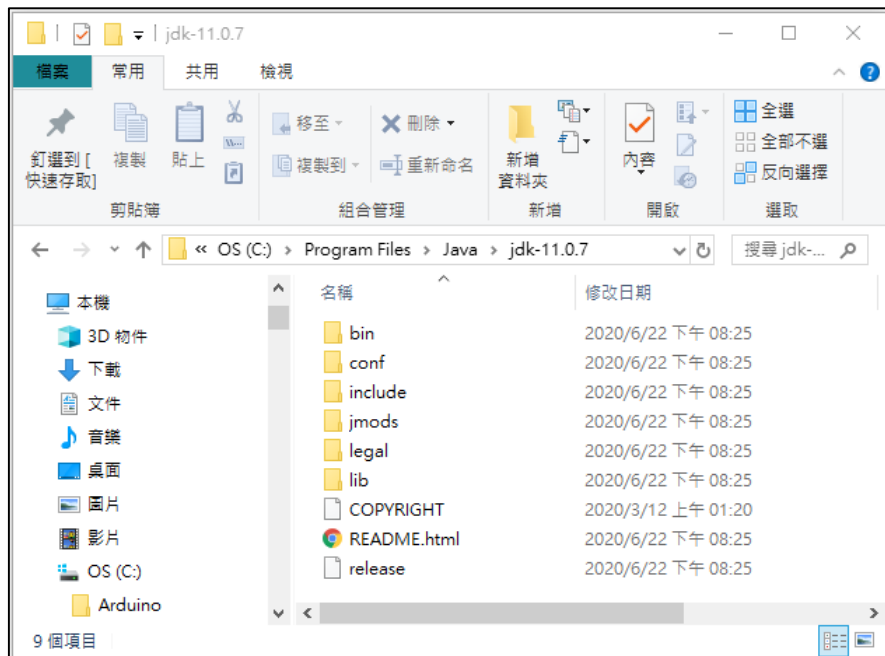
■ 測試

- java -version
- javac

環境變數設定 Windows

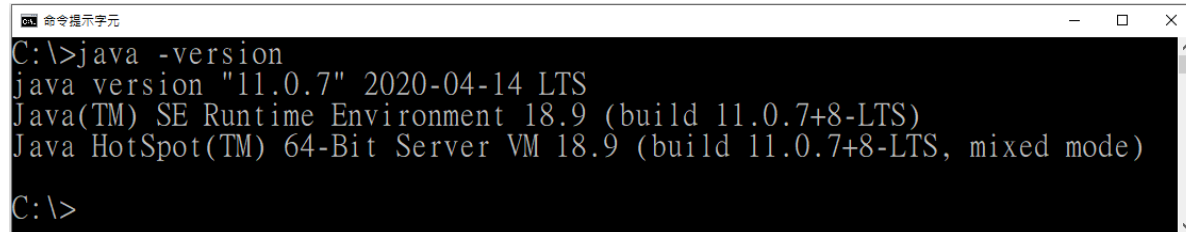


環境變數設定

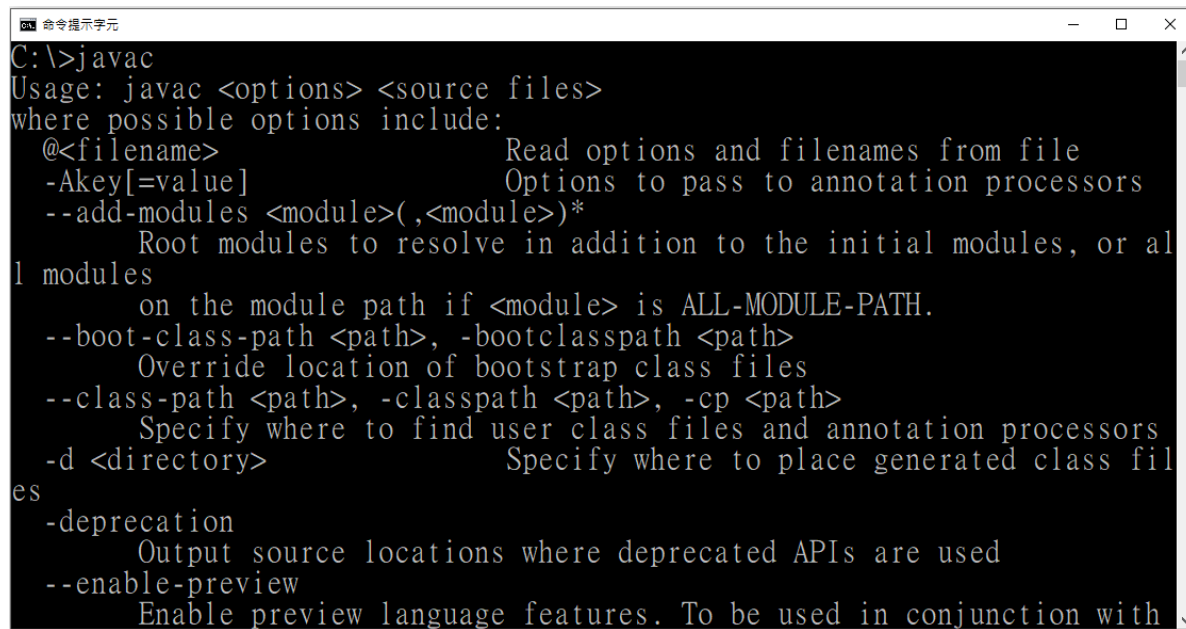


測試

- 測試環境變數
 - java -version
 - javac



```
C:\>java -version
java version "11.0.7" 2020-04-14 LTS
Java(TM) SE Runtime Environment 18.9 (build 11.0.7+8-LTS)
Java HotSpot(TM) 64-Bit Server VM 18.9 (build 11.0.7+8-LTS, mixed mode)
C:\>
```



```
C:\>javac
Usage: javac <options> <source files>
where possible options include:
    @<filename>                Read options and filenames from file
    -Akey[=value]              Options to pass to annotation processors
    --add-modules <module>(,<module>)*
                               Root modules to resolve in addition to the initial modules, or all modules
                               on the module path if <module> is ALL-MODULE-PATH.
    --boot-class-path <path>, -bootclasspath <path>
                               Override location of bootstrap class files
    --class-path <path>, -classpath <path>, -cp <path>
                               Specify where to find user class files and annotation processors
    -d <directory>             Specify where to place generated class files
    -deprecation                Output source locations where deprecated APIs are used
    --enable-preview            Enable preview language features. To be used in conjunction with
```

安裝 NetBeans IDE

- NetBeans 下載

- <https://netbeans.apache.org/download/index.html>

- Apache-Netbeans-11.x-bin-windows-x64.exe

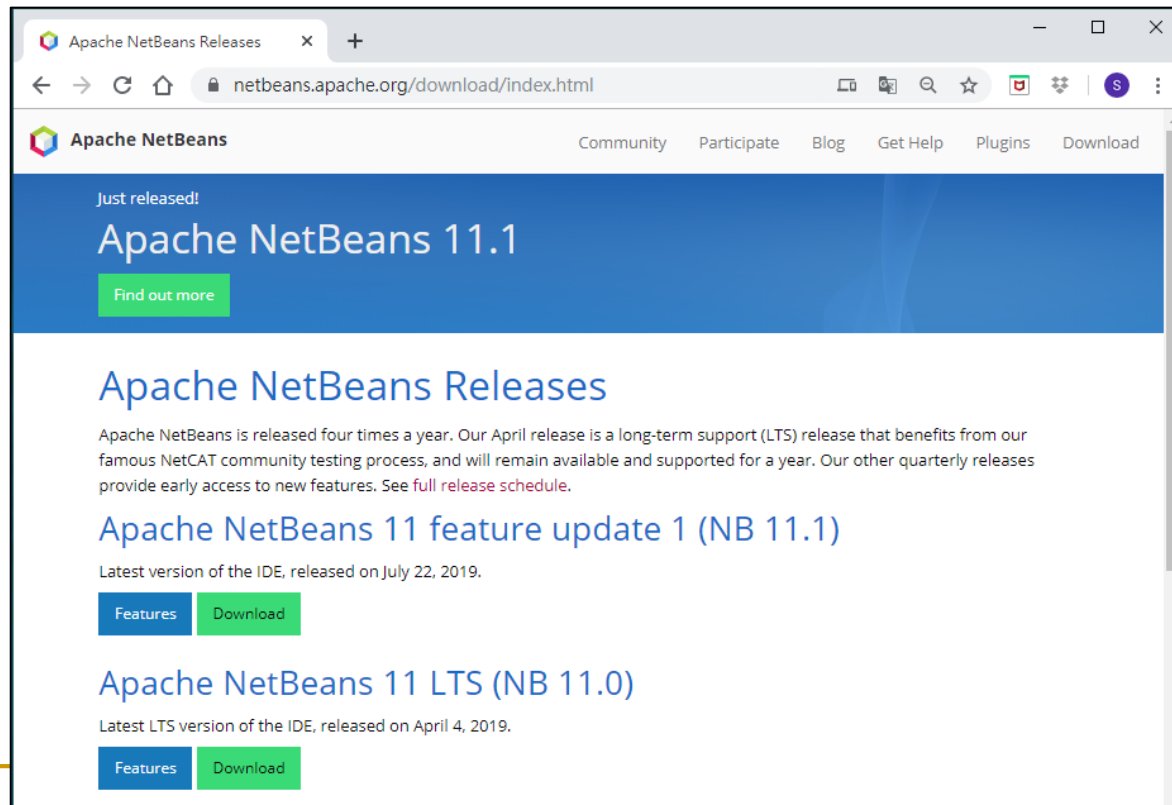
- 安裝 NetBeans

- 測試

安裝 NetBeans IDE

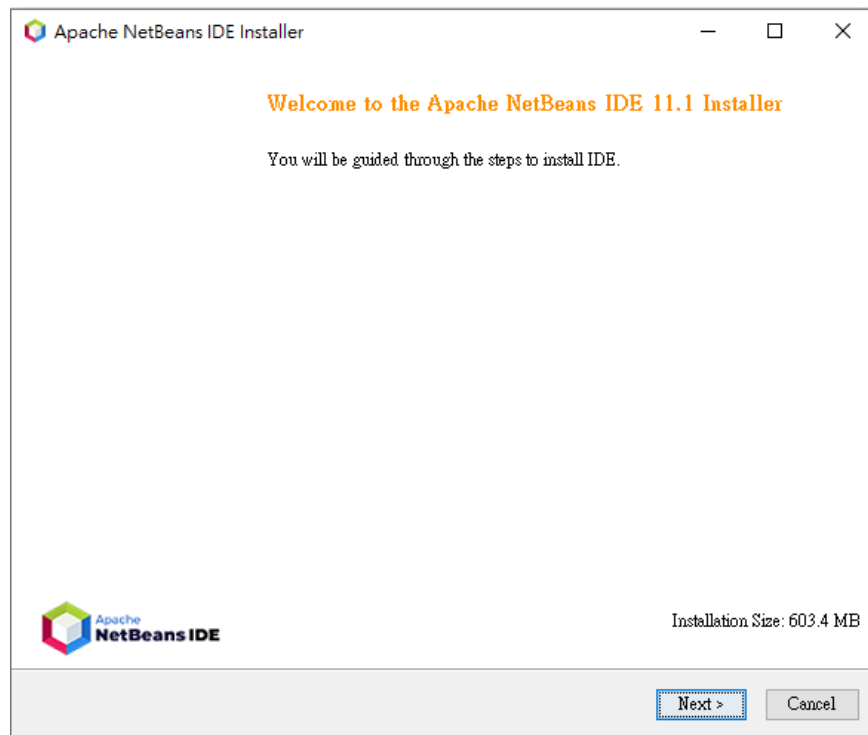
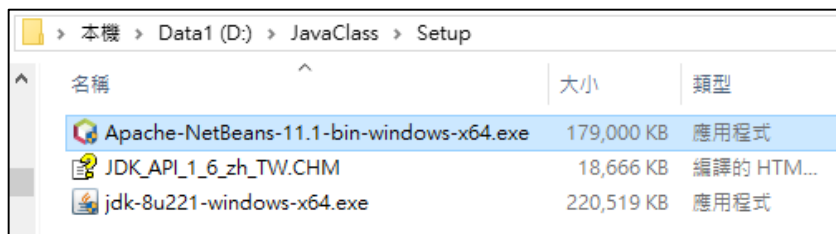
■ NetBeans 下載

□ <https://netbeans.apache.org/download/index.html>

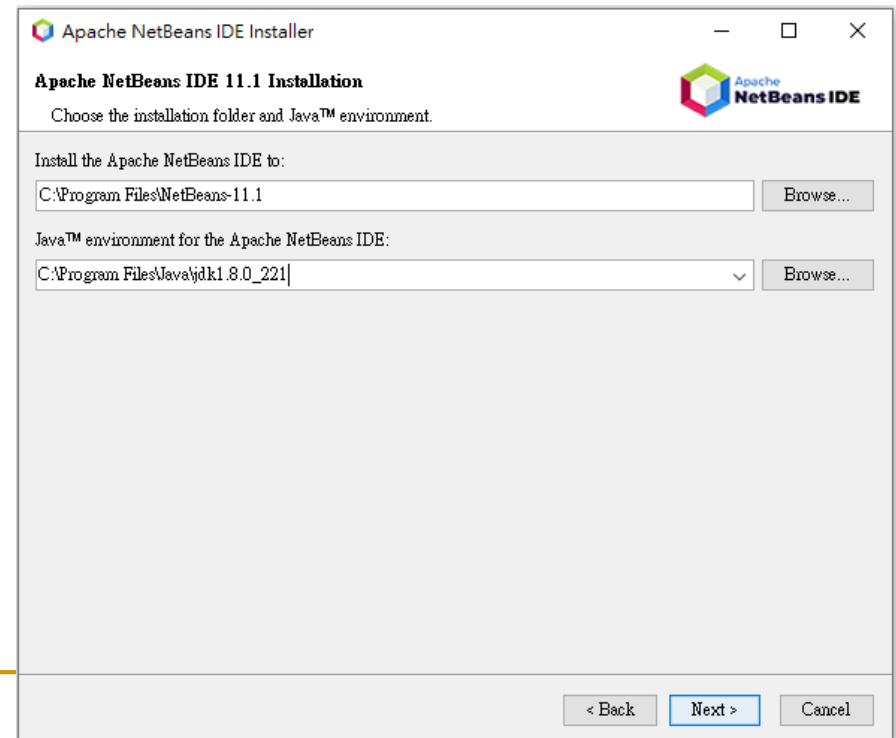
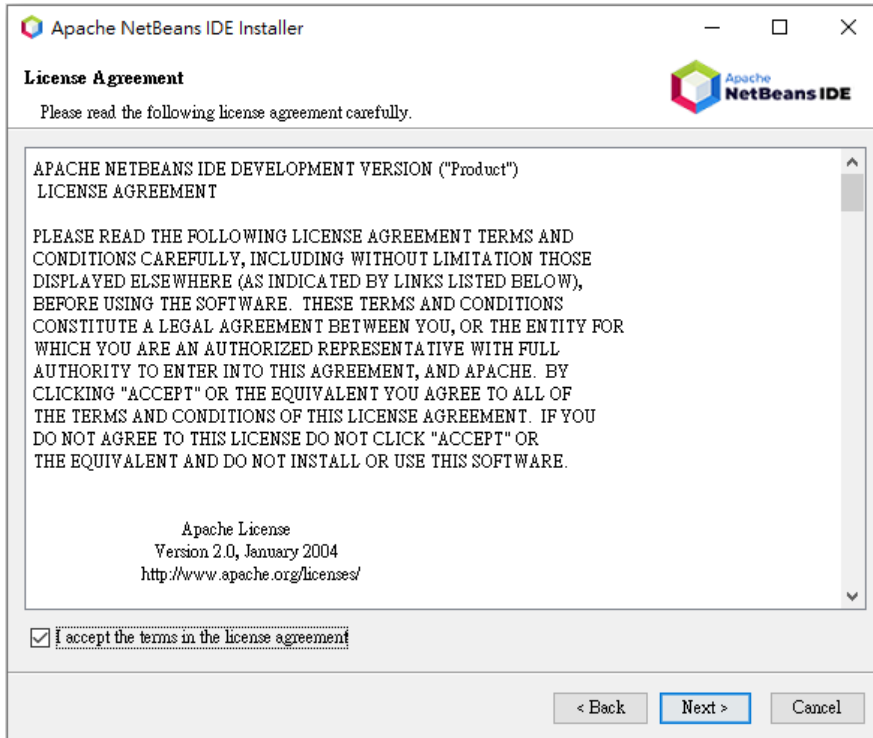


安裝 NetBeans IDE

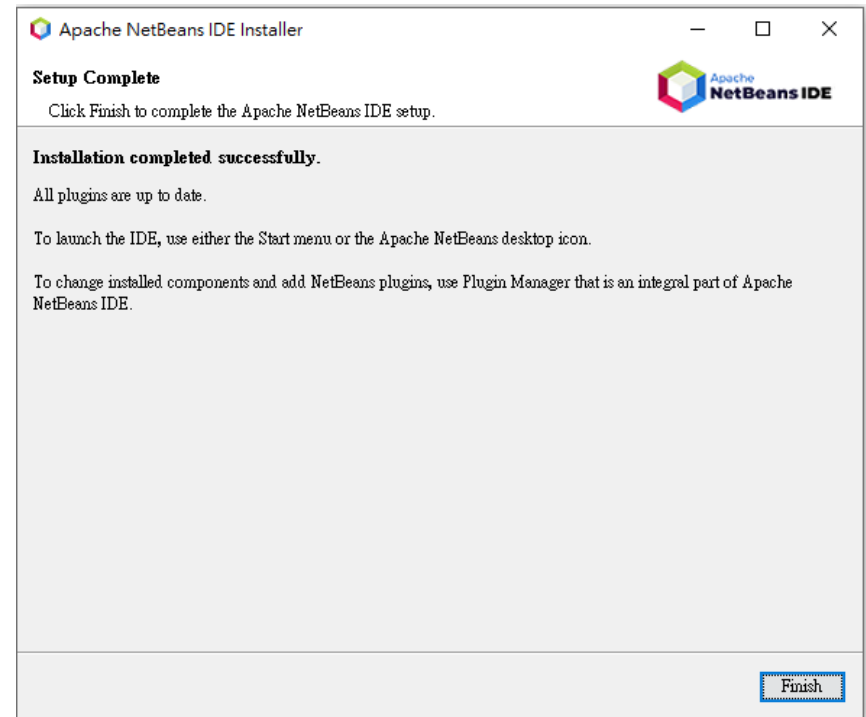
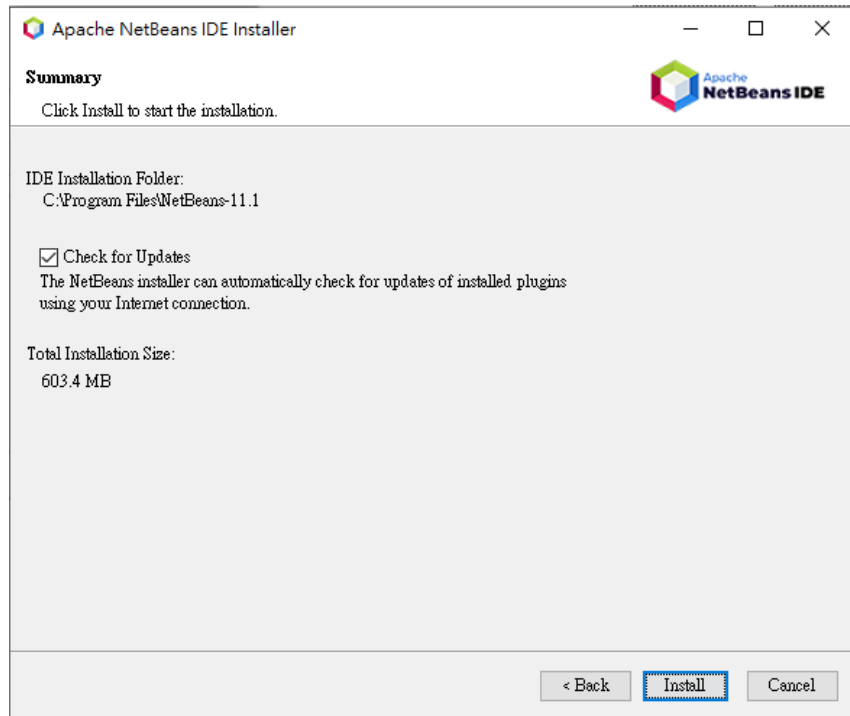
- 執行 Apache-Netbeans-11.x-bin-windows-x64.exe



安裝 NetBeans IDE



安裝 NetBeans IDE



安裝 Tomcat

■ 下載Tomcat

- <https://tomcat.apache.org/download-90.cgi>
- apache-tomcat-9.0.x.exe

■ 安裝Tomcat

- 設定Shutdown Port
- 設定管理者帳號密碼

■ 檢視伺服器設定

安裝 Tomcat

■ 環境變數設定

- 新增 CATALINA_HOME = [Tomcat 安裝路徑]

CATALINA_HOME = C:\Program Files\Apache Software Foundation\Tomcat 9.0

- 編輯 PATH

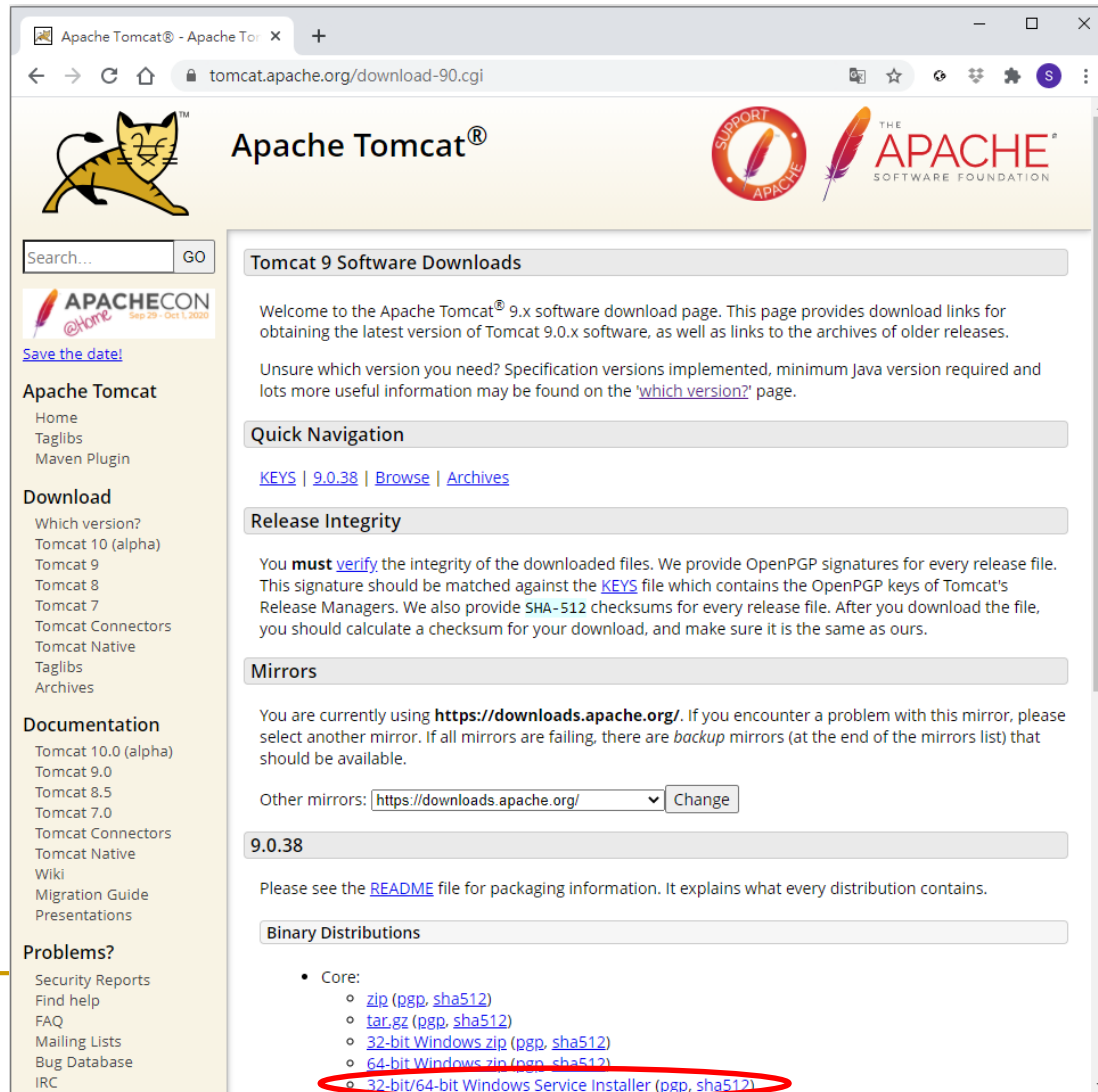
PATH = %CATALINA_HOME%\bin;

■ 測試

- 啟動關閉 Tomcat
- 瀏覽器檢視內建網站

下載 Tomcat

- 下載位置：<https://tomcat.apache.org/download-90.cgi>



The screenshot shows the Apache Tomcat 9.0.x software download page. The page features the Apache Tomcat logo (a yellow cat) and the Apache Software Foundation logo. The main content area is titled "Tomcat 9 Software Downloads" and includes a welcome message, a "Quick Navigation" section with links to KEYS, 9.0.38, Browse, and Archives, and a "Release Integrity" section. The "Mirrors" section lists other mirrors, including the default one at https://downloads.apache.org/. The "9.0.38" section provides a link to the README file. The "Binary Distributions" section lists the available download packages, with the "32-bit/64-bit Windows Service Installer (pgp, sha512)" package highlighted by a red circle.

Apache Tomcat®

Tomcat 9 Software Downloads

Welcome to the Apache Tomcat® 9.x software download page. This page provides download links for obtaining the latest version of Tomcat 9.0.x software, as well as links to the archives of older releases.

Unsure which version you need? Specification versions implemented, minimum Java version required and lots more useful information may be found on the ["which version?"](#) page.

Quick Navigation

[KEYS](#) | [9.0.38](#) | [Browse](#) | [Archives](#)

Release Integrity

You **must** [verify](#) the integrity of the downloaded files. We provide OpenPGP signatures for every release file. This signature should be matched against the [KEYS](#) file which contains the OpenPGP keys of Tomcat's Release Managers. We also provide [SHA-512](#) checksums for every release file. After you download the file, you should calculate a checksum for your download, and make sure it is the same as ours.

Mirrors

You are currently using <https://downloads.apache.org/>. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are [backup](#) mirrors (at the end of the mirrors list) that should be available.

Other mirrors:


9.0.38

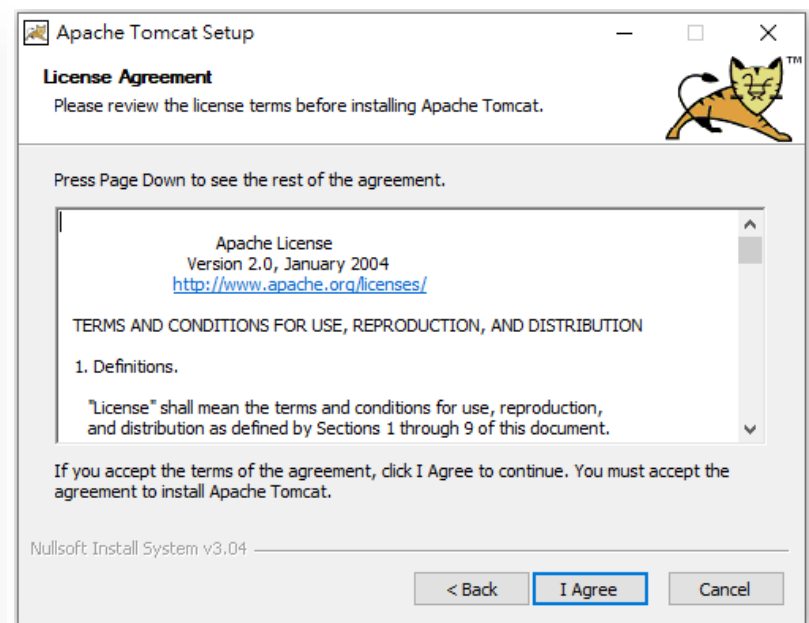
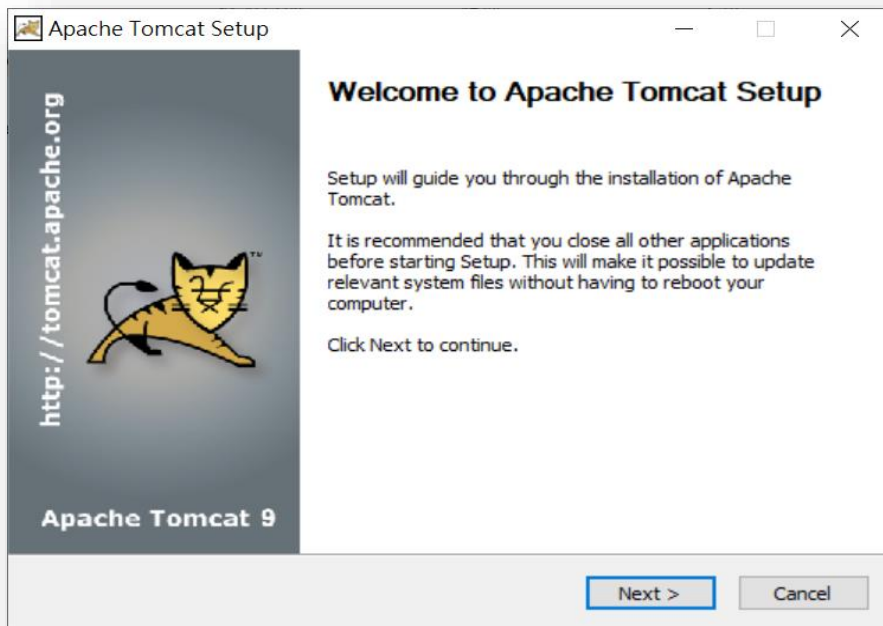
Please see the [README](#) file for packaging information. It explains what every distribution contains.

Binary Distributions

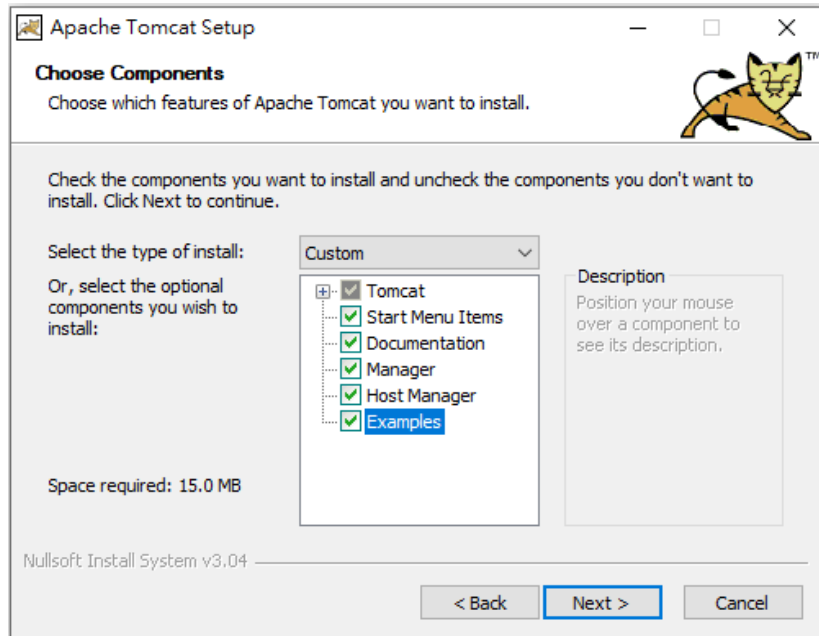
- Core:
 - [zip \(pgp, sha512\)](#)
 - [tar.gz \(pgp, sha512\)](#)
 - [32-bit Windows zip \(pgp, sha512\)](#)
 - [64-bit Windows zip \(pgp, sha512\)](#)
 - [32-bit/64-bit Windows Service Installer \(pgp, sha512\)](#)

安裝 Tomcat

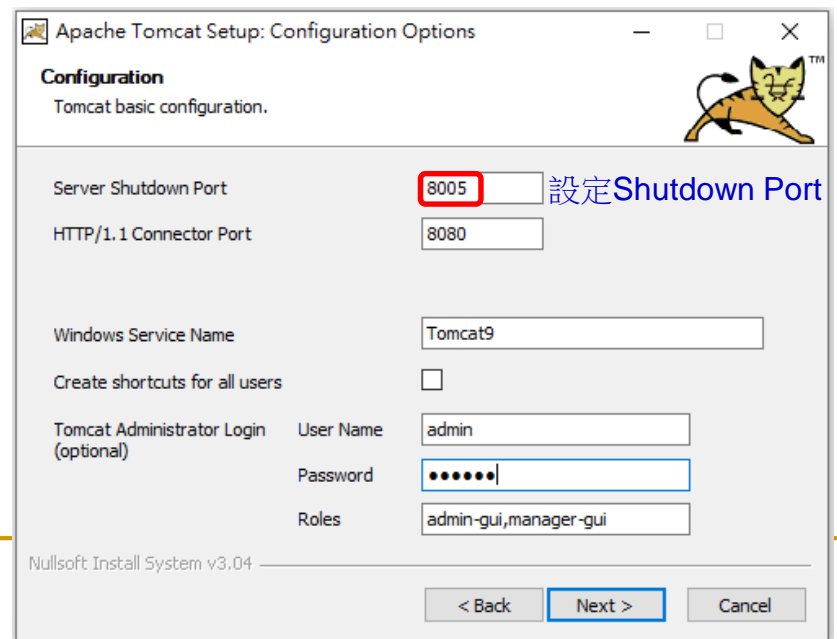
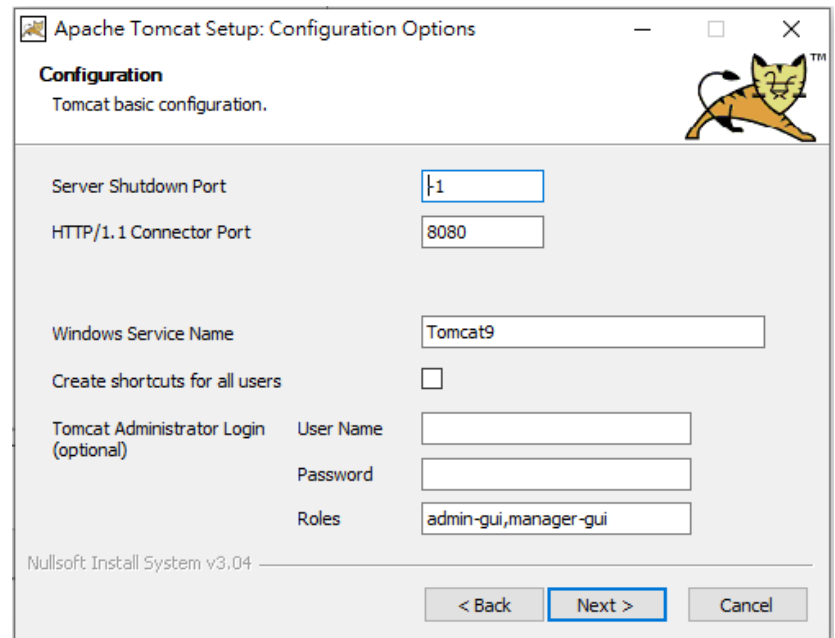
> 本機 > Data1 (D:) > JavaEE > Setup		
名稱	類型	大小
 apache-tomcat-9.0.33.exe	應用程式	11,604 KB



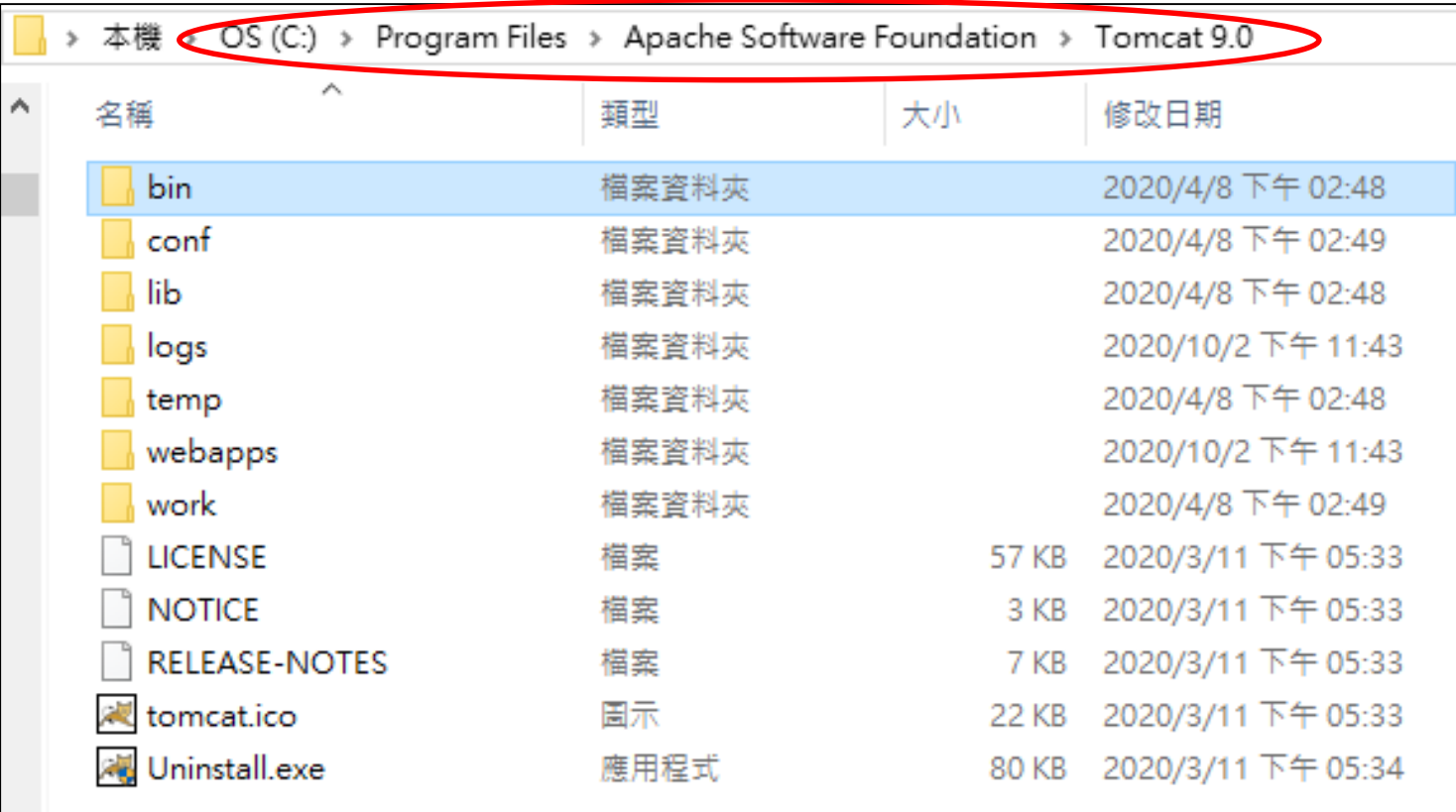
安裝 Tomcat



Username: admin
Password: tomcat



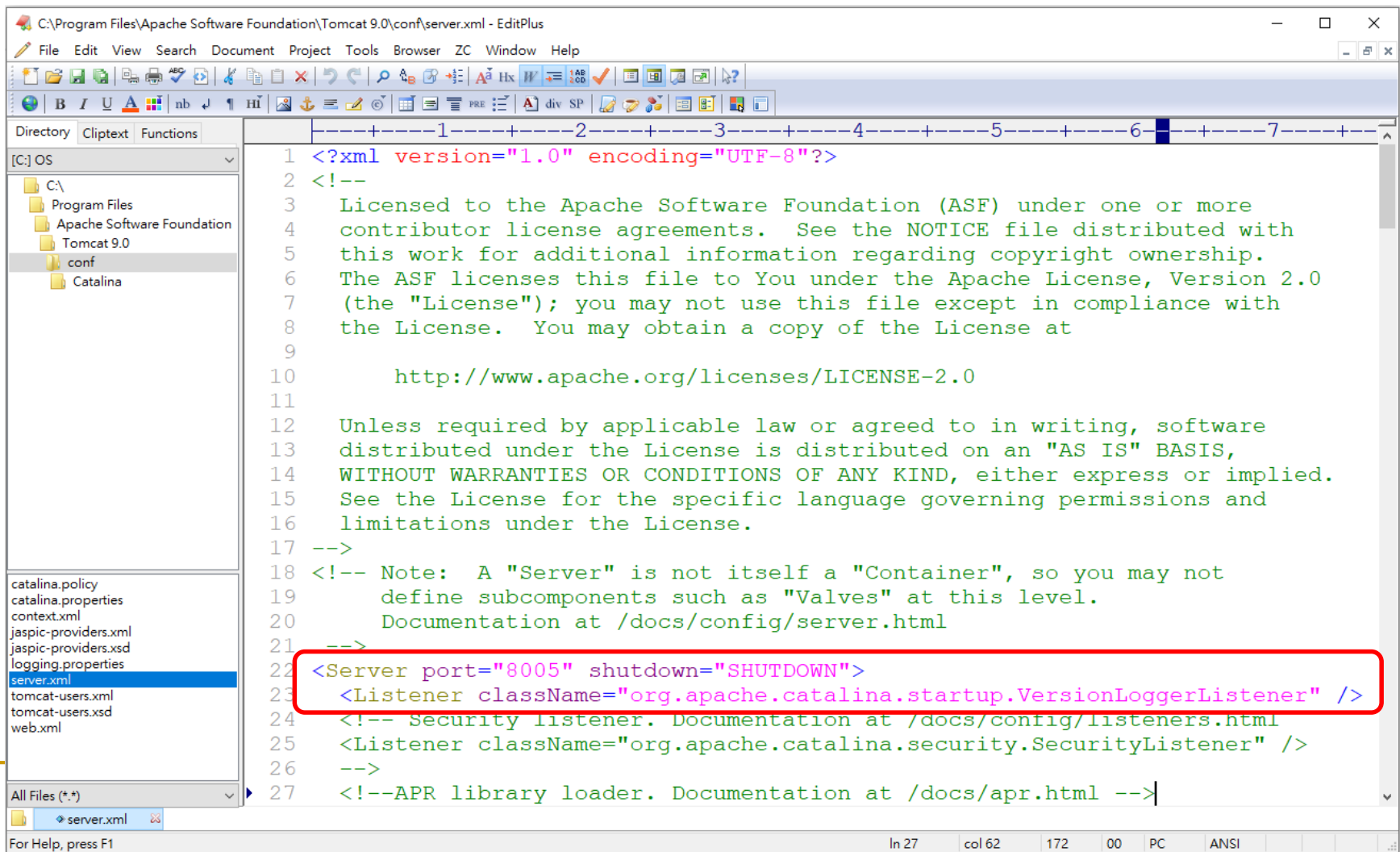
安裝 Tomcat



名稱	類型	大小	修改日期
bin	檔案資料夾		2020/4/8 下午 02:48
conf	檔案資料夾		2020/4/8 下午 02:49
lib	檔案資料夾		2020/4/8 下午 02:48
logs	檔案資料夾		2020/10/2 下午 11:43
temp	檔案資料夾		2020/4/8 下午 02:48
webapps	檔案資料夾		2020/10/2 下午 11:43
work	檔案資料夾		2020/4/8 下午 02:49
LICENSE	檔案	57 KB	2020/3/11 下午 05:33
NOTICE	檔案	3 KB	2020/3/11 下午 05:33
RELEASE-NOTES	檔案	7 KB	2020/3/11 下午 05:33
tomcat.ico	圖示	22 KB	2020/3/11 下午 05:33
Uninstall.exe	應用程式	80 KB	2020/3/11 下午 05:34

檢視 Tomcat Server 設定

■ [Tomcat安裝路徑]\conf\server.xml



```
C:\Program Files\Apache Software Foundation\Tomcat 9.0\conf\server.xml - EditPlus
File Edit View Search Document Project Tools Browser ZC Window Help
[Directory] [Cliptext] [Functions]
[C:\OS]
  C:\
  Program Files
  Apache Software Foundation
  Tomcat 9.0
  conf
  Catalina
catalina.policy
catalina.properties
context.xml
jaspic-providers.xml
jaspic-providers.xsd
logging.properties
server.xml
tomcat-users.xml
tomcat-users.xsd
web.xml
All Files (*.*)
server.xml
For Help, press F1

1 <?xml version="1.0" encoding="UTF-8"?>
2 <!--
3 Licensed to the Apache Software Foundation (ASF) under one or more
4 contributor license agreements. See the NOTICE file distributed with
5 this work for additional information regarding copyright ownership.
6 The ASF licenses this file to You under the Apache License, Version 2.0
7 (the "License"); you may not use this file except in compliance with
8 the License. You may obtain a copy of the License at
9
10 http://www.apache.org/licenses/LICENSE-2.0
11
12 Unless required by applicable law or agreed to in writing, software
13 distributed under the License is distributed on an "AS IS" BASIS,
14 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
15 See the License for the specific language governing permissions and
16 limitations under the License.
17 -->
18 <!-- Note: A "Server" is not itself a "Container", so you may not
19 define subcomponents such as "Valves" at this level.
20 Documentation at /docs/config/server.html
21 -->
22 <Server port="8005" shutdown="SHUTDOWN">
23   <Listener className="org.apache.catalina.startup.VersionLoggerListener" />
24   <!-- Security listener. Documentation at /docs/config/listeners.html
25   <Listener className="org.apache.catalina.security.SecurityListener" />
26   -->
27   <!--APR library loader. Documentation at /docs/apr.html -->
```

Tomcat 設定

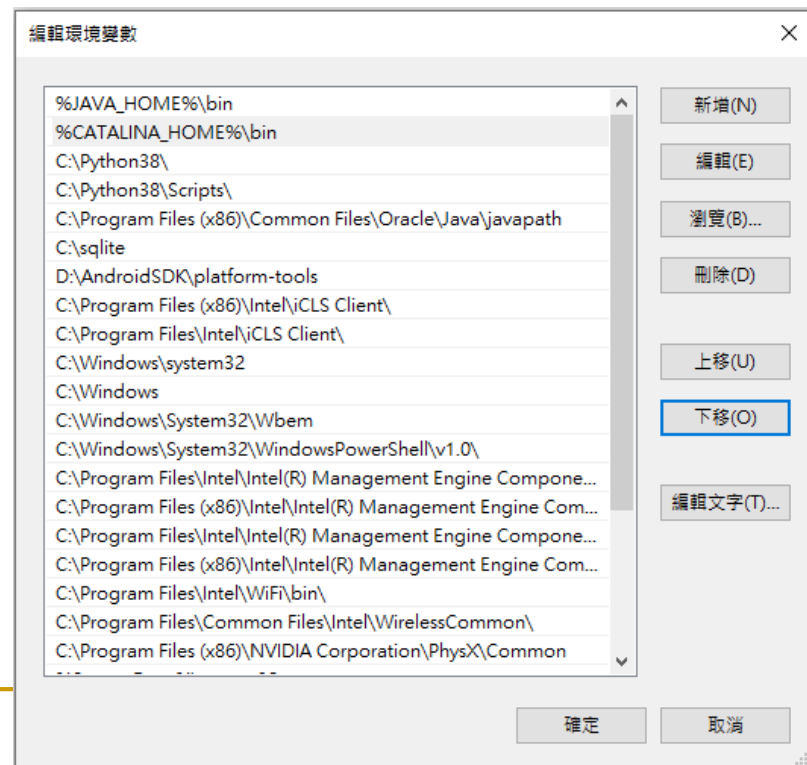
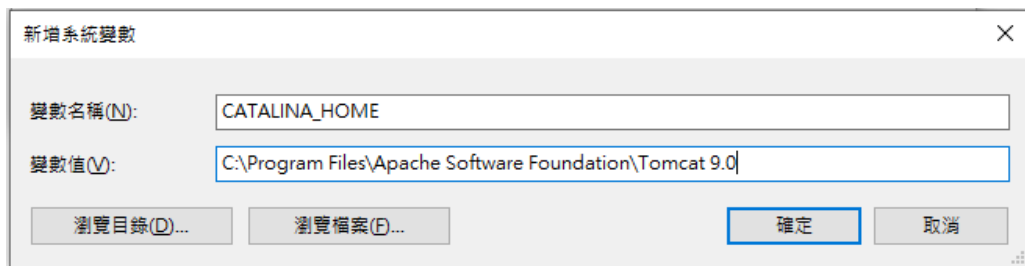
■ 環境變數設定

- 新增 CATALINA_HOME = [Tomcat 安裝路徑]

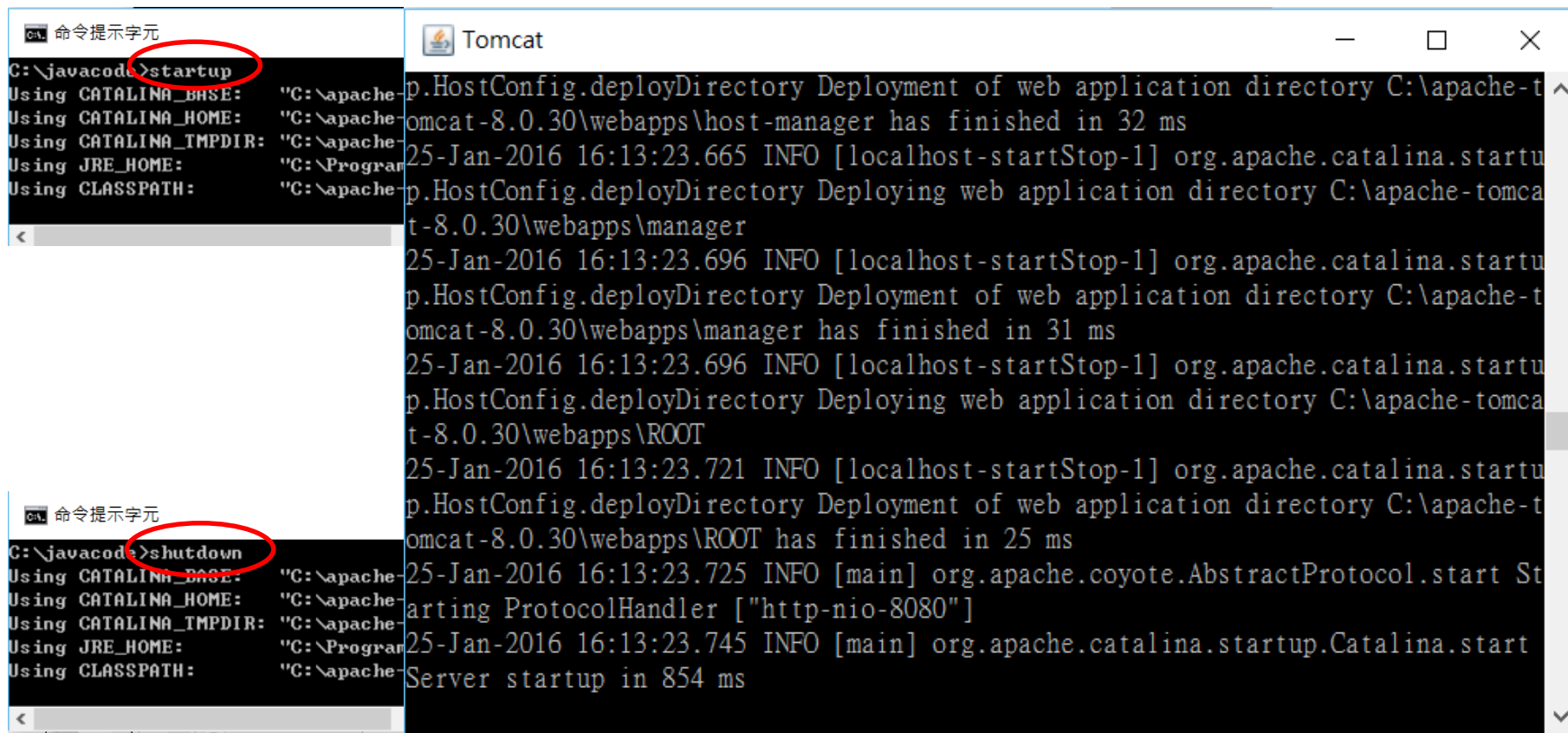
CATALINA_HOME = C:\Program Files\Apache Software Foundation\Tomcat 9.0

- 編輯 PATH

PATH = %CATALINA_HOME%\bin



測試 - 啟動/關閉 Tomcat



The image shows a Windows command prompt window titled '命令提示字元' (Command Prompt) and a Tomcat application window titled 'Tomcat'. The command prompt shows the execution of 'startup' and 'shutdown' commands. The Tomcat window displays the corresponding log output.

命令提示字元 (Command Prompt):

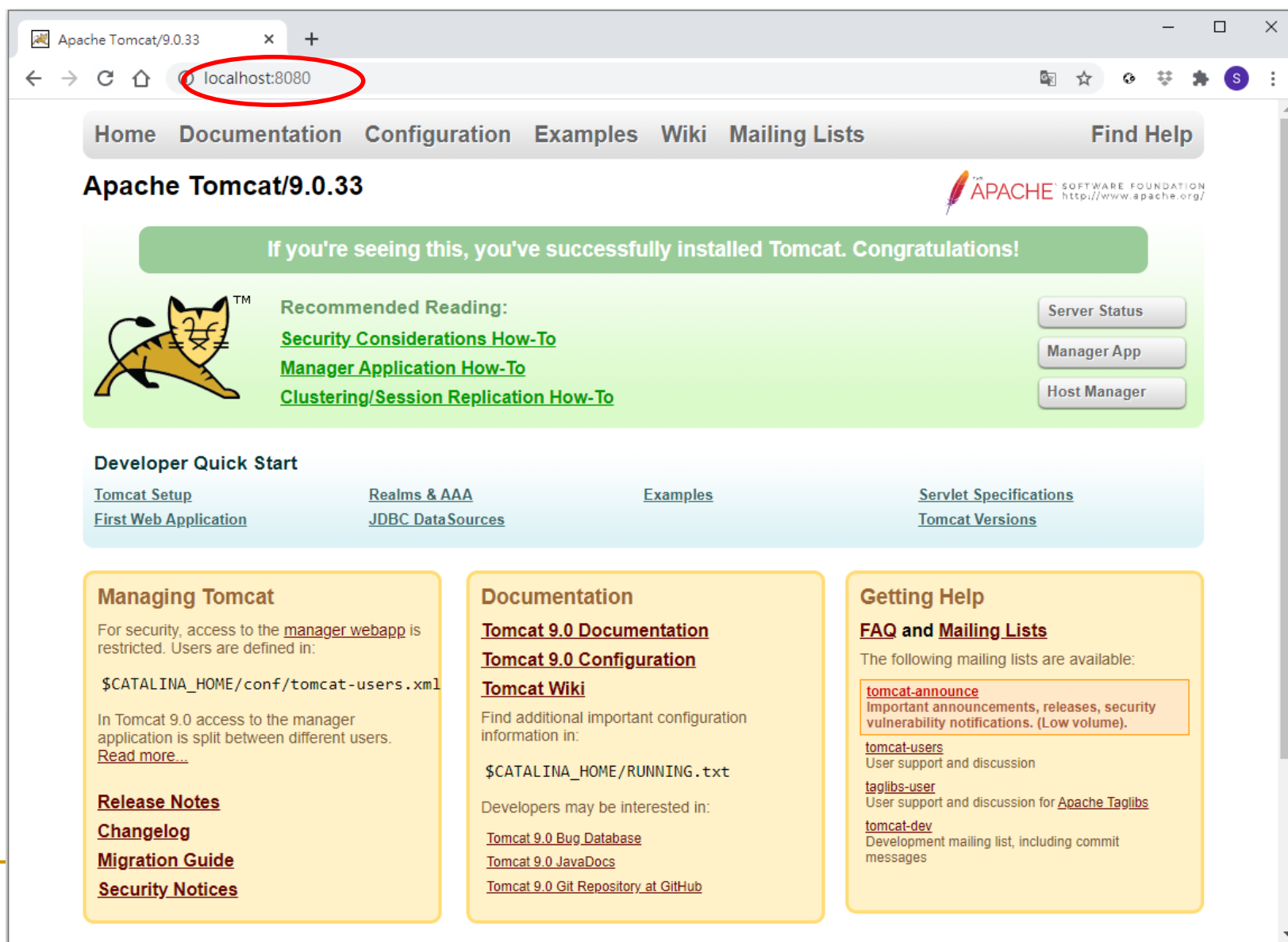
```
C:\javacode>startup
Using CATALINA_BASE:   "C:\apache-tomcat-8.0.30"
Using CATALINA_HOME:   "C:\apache-tomcat-8.0.30"
Using CATALINA_TMPDIR: "C:\apache-tomcat-8.0.30\temp"
Using JRE_HOME:        "C:\Program Files\Java\jre7"
Using CLASSPATH:       "C:\apache-tomcat-8.0.30\bin\bootstrap.jar;C:\apache-tomcat-8.0.30\bin\tomcat-juli.jar"

C:\javacode>shutdown
Using CATALINA_BASE:   "C:\apache-tomcat-8.0.30"
Using CATALINA_HOME:   "C:\apache-tomcat-8.0.30"
Using CATALINA_TMPDIR: "C:\apache-tomcat-8.0.30\temp"
Using JRE_HOME:        "C:\Program Files\Java\jre7"
Using CLASSPATH:       "C:\apache-tomcat-8.0.30\bin\bootstrap.jar;C:\apache-tomcat-8.0.30\bin\tomcat-juli.jar"
```

Tomcat Log Output:

```
25-Jan-2016 16:13:23.665 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory C:\apache-tomcat-8.0.30\webapps\host-manager has finished in 32 ms
25-Jan-2016 16:13:23.696 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory C:\apache-tomcat-8.0.30\webapps\manager
25-Jan-2016 16:13:23.696 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory C:\apache-tomcat-8.0.30\webapps\manager has finished in 31 ms
25-Jan-2016 16:13:23.696 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory C:\apache-tomcat-8.0.30\webapps\ROOT
25-Jan-2016 16:13:23.721 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory C:\apache-tomcat-8.0.30\webapps\ROOT has finished in 25 ms
25-Jan-2016 16:13:23.725 INFO [main] org.apache.coyote.AbstractProtocol.start Starting ProtocolHandler ["http-nio-8080"]
25-Jan-2016 16:13:23.745 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in 854 ms
```

測試 - 啟動瀏覽器



NetBeans 管理 Tomcat

■ NetBeans 設定管理 Tomcat

□ Services – Server 管理

■ 新增 Apache Tomcat or TomEE Server

□ 指定Tomcat安裝目錄

□ 管理者帳號密碼

■ 測試

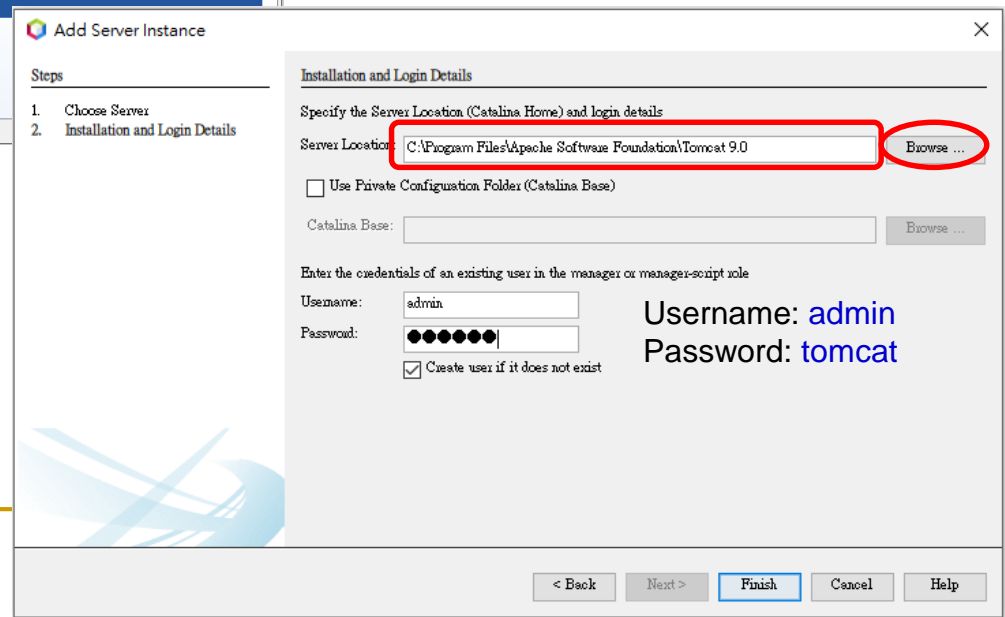
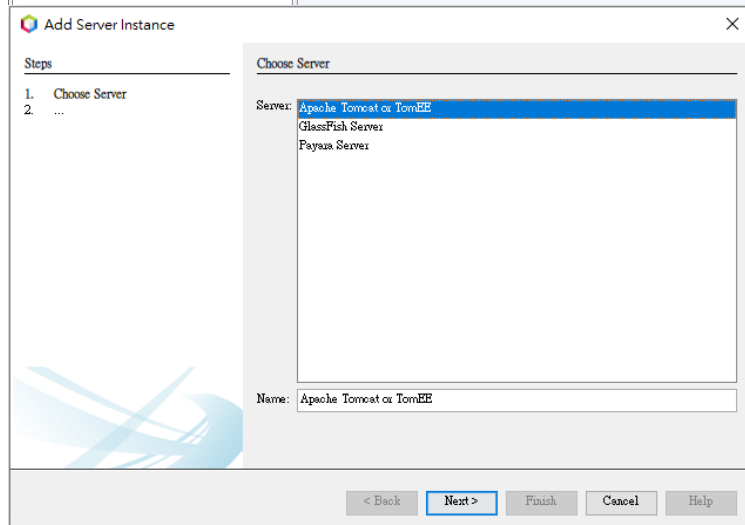
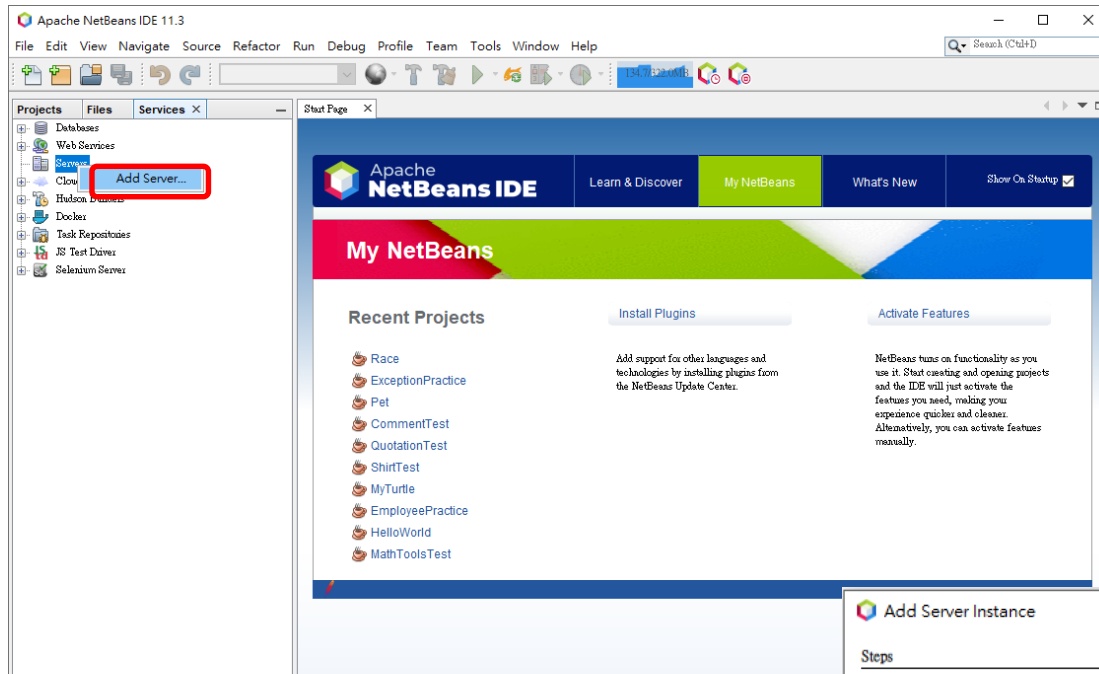
□ NetBeans 中啟動Tomcat

□ Tomcat 伺服器首頁

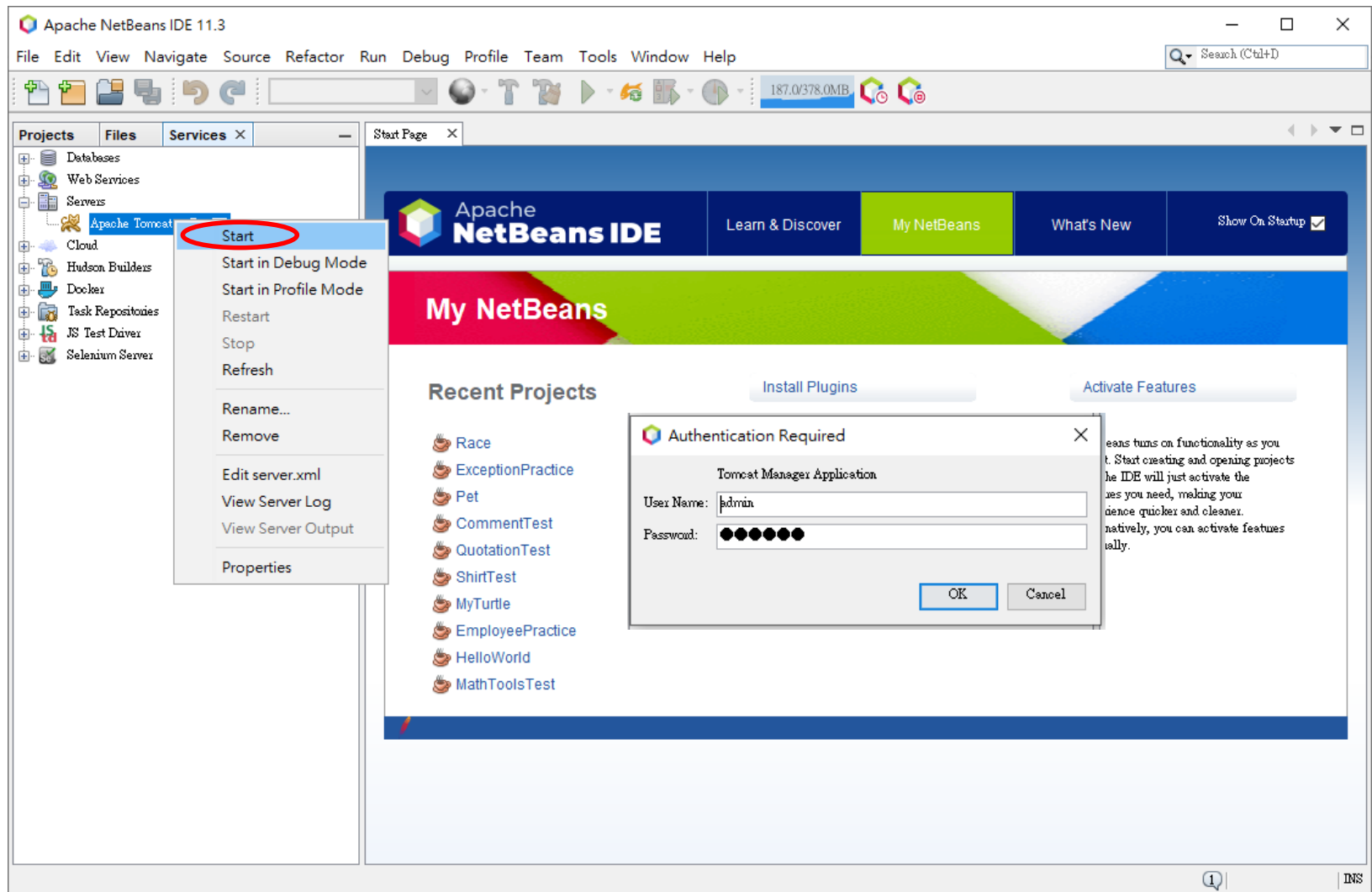
□ WebApp Manager (Optional)

■ Tomcat User設定管理者帳號，新增manager-gui權限

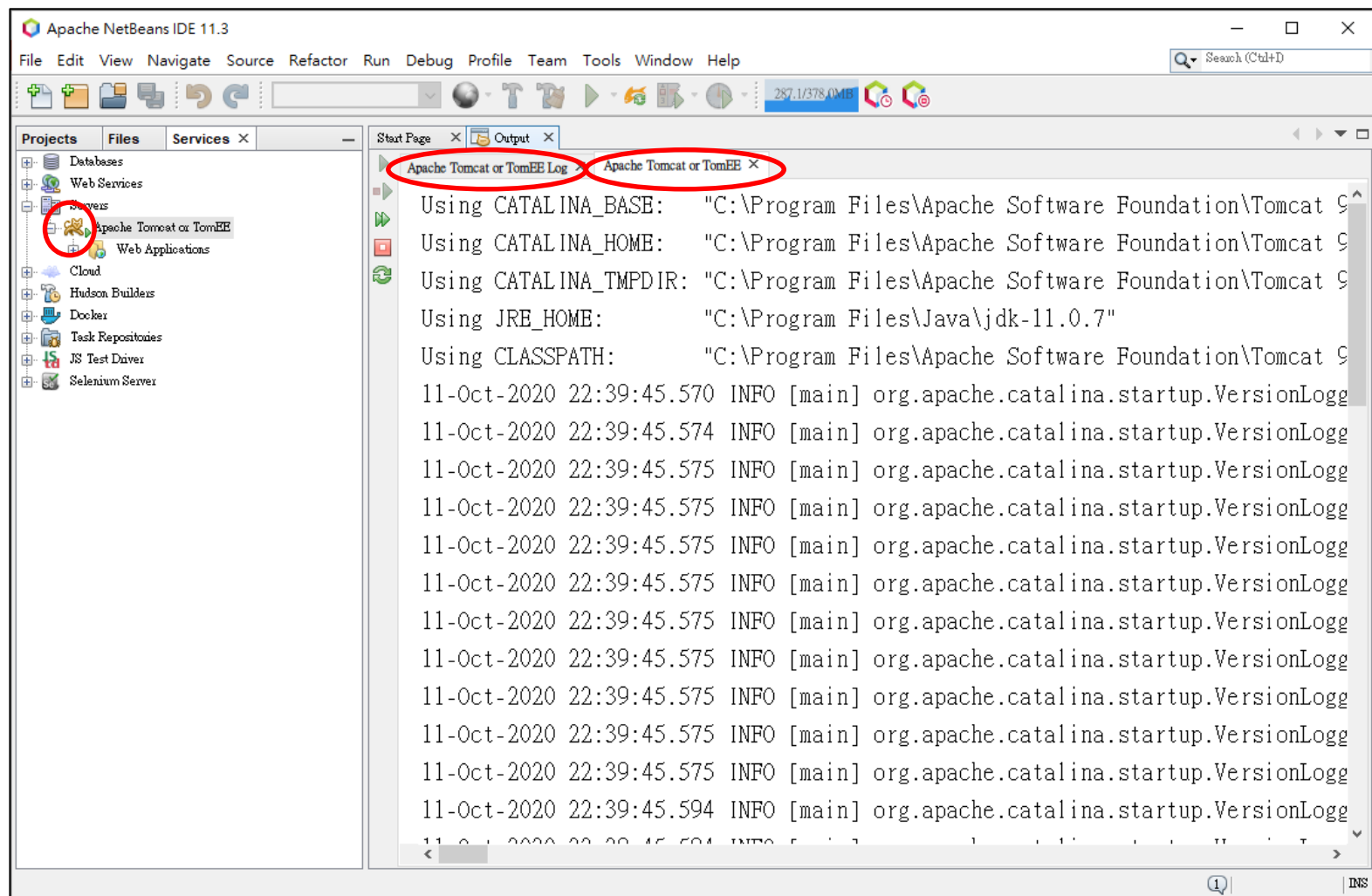
NetBeans 設定管理 Tomcat



測試 - NetBeans 中啟動Tomcat



測試 - NetBeans中啟動Tomcat



測試 – 連結Tomcat 首頁


Apache Tomcat/9.0.33

localhost:8080

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat/9.0.33

If you're seeing this, you've successfully installed Tomcat. Congratulations!



Recommended Reading:

- [Security Considerations How-To](#)
- [Manager Application How-To](#)
- [Clustering/Session Replication How-To](#)

Server Status
Manager App
Host Manager

Developer Quick Start

- [Tomcat Setup](#)
- [First Web Application](#)
- [Realms & AAA](#)
- [JDBC DataSources](#)
- [Examples](#)
- [Servlet Specifications](#)
- [Tomcat Versions](#)

Managing Tomcat

For security, access to the manager webapp is restricted. Users are defined in:

```
$CATALINA_HOME/conf/tomcat-users.xml
```

In Tomcat 9.0 access to the manager application is split between different users.
[Read more...](#)

[Release Notes](#)
[Changelog](#)
[Migration Guide](#)
[Security Notices](#)

Documentation

[Tomcat 9.0 Documentation](#)
[Tomcat 9.0 Configuration](#)
[Tomcat Wiki](#)

Find additional important configuration information in:

```
$CATALINA_HOME/RUNNING.txt
```

Developers may be interested in:

- [Tomcat 9.0 Bug Database](#)
- [Tomcat 9.0 JavaDocs](#)
- [Tomcat 9.0 Git Repository at GitHub](#)

Getting Help

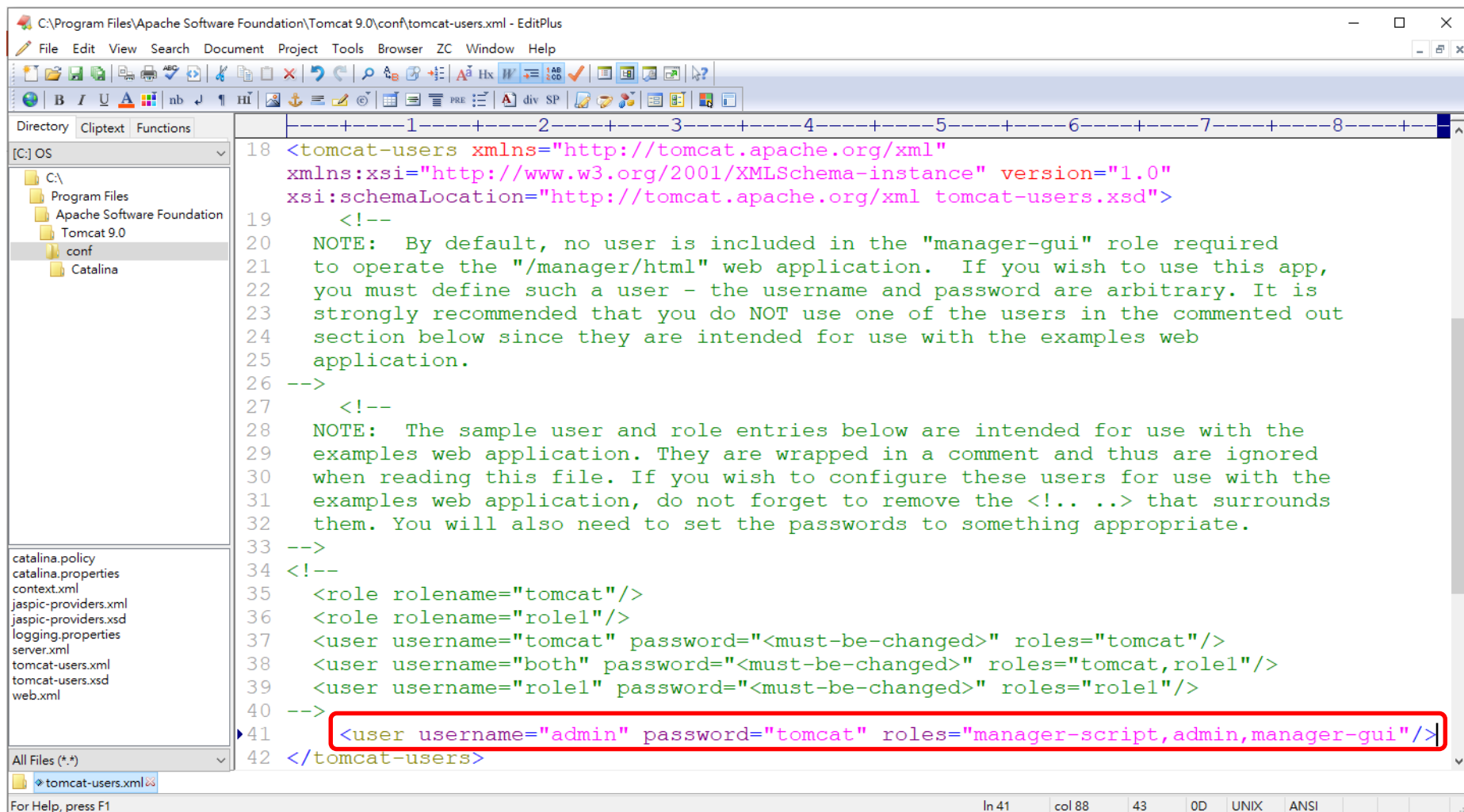
[FAQ and Mailing Lists](#)

The following mailing lists are available:

- [tomcat-announce](#)
Important announcements, releases, security vulnerability notifications. (Low volume).
- [tomcat-users](#)
User support and discussion
- [taglibs-user](#)
User support and discussion for [Apache Taglibs](#)
- [tomcat-dev](#)
Development mailing list, including commit messages


檢視 Tomcat User設定

■ [Tomcat安裝路徑]\conf\tomcat-users.xml



```
C:\Program Files\Apache Software Foundation\Tomcat 9.0\conf\tomcat-users.xml - EditPlus
File Edit View Search Document Project Tools Browser ZC Window Help
B I U A nb H1 PRE div SP
Directory Cliptext Functions
[C:] OS
  C:\
  Program Files
  Apache Software Foundation
  Tomcat 9.0
  conf
  Catalina
catalina.policy
catalina.properties
context.xml
jaspic-providers.xml
jaspic-providers.xsd
logging.properties
server.xml
tomcat-users.xml
tomcat-users.xsd
web.xml
All Files (*.*)
tomcat-users.xml
18 <tomcat-users xmlns="http://tomcat.apache.org/xml"
19   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" version="1.0"
20   xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd">
21   <!--
22     NOTE: By default, no user is included in the "manager-gui" role required
23     to operate the "/manager/html" web application.  If you wish to use this app,
24     you must define such a user - the username and password are arbitrary.  It is
25     strongly recommended that you do NOT use one of the users in the commented out
26     section below since they are intended for use with the examples web
27     application.
28   -->
29   <!--
30     NOTE: The sample user and role entries below are intended for use with the
31     examples web application.  They are wrapped in a comment and thus are ignored
32     when reading this file.  If you wish to configure these users for use with the
33     examples web application, do not forget to remove the <!-- .. --> that surrounds
34     them.  You will also need to set the passwords to something appropriate.
35   -->
36   <!--
37     <role rolename="tomcat"/>
38     <role rolename="role1"/>
39     <user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
40     <user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
41     <user username="role1" password="<must-be-changed>" roles="role1"/>
42   -->
43   <user username="admin" password="tomcat" roles="manager-script,admin,manager-gui"/>
44 </tomcat-users>
```

測試-WebApp Manager

**The Apache Software Foundation**
<http://www.apache.org/>

Tomcat Web Application Manager

Message: OK

Manager

[List Applications](#)[HTML Manager Help](#)[Manager Help](#)[Server Status](#)

Applications

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

登入

http://localhost:8080

使用者名稱 admin

密碼

登入 取消