



# Deploying your first Java Application to AWS-3 (Installations)

Hands-On Workshop | Digital Summit '18

## Miracle Innovation Labs

Miracle Software Systems, Inc.

## Deploying your first Java Application to AWS-3 (Installations)

### Introduction

The goal of this document is to install and configure Java, Maven and deploying a sample Maven Application on Tomcat.

This guide was prepared by [Miracle's Innovation Labs](#).

### Pre-Requisites

All attendees must have their workstation (with Internet) to participate in the workshop (Both PC and MAC are compatible). The following pre-requisites will help you to make the workshop experience easier.

- AWS account
- Download and install Java
- Download and install Maven
- Text Editor such as Notepad++ (or) Sublime Text

### Technology Involved

- AWS
- Java
- Maven
- Apache Tomcat
- Git

## Lab Steps

So, let us get started with the application!

In this document, we will show you how to install Java, Maven and setting their permanent paths.

Also, we will be showing how to get the sample **Maven\_Application** from Github, creating **.war** file and finally deploying the application on **Tomcat** server.

### Step #1 | Installation of Java on Windows

To download the **Java Development Kit (JDK)**, launch your web browser (e.g. Internet Explorer) and go to the below link,

<http://java.sun.com/javase/downloads/index.jsp>

Once you open the link, it displays multiple download options. The page displays the most frequent JDK download options (e.g. JDK1.8).

Click on the **DOWNLOAD** button that corresponds to the Oracle Java JDK.

<b>Java SE 8u191 / Java SE 8u192</b> Java SE 8u191 / Java SE 8u192 includes important bug fixes. Oracle strongly recommends that all Java SE 8 users upgrade to this release. <a href="#">Learn more</a> ▶	
<ul style="list-style-type: none"><li>▪ <a href="#">Installation Instructions</a></li><li>▪ <a href="#">Release Notes</a></li><li>▪ <a href="#">Oracle License</a></li><li>▪ <a href="#">Java SE Licensing Information User Manual</a><ul style="list-style-type: none"><li>▪ Includes Third Party Licenses</li></ul></li><li>▪ <a href="#">Certified System Configurations</a></li><li>▪ <a href="#">Readme Files</a><ul style="list-style-type: none"><li>▪ <a href="#">JDK ReadMe</a></li><li>▪ <a href="#">JRE ReadMe</a></li></ul></li></ul>	<div><b>JDK</b> <b>DOWNLOAD</b> ⬇</div> <div><b>Server JRE</b> <b>DOWNLOAD</b> ⬇</div> <div><b>JRE</b> <b>DOWNLOAD</b> ⬇</div>

After clicking on the DOWNLOAD button, you will be redirected to the Downloads page.

You need to check mark the radio button of **Accept License Agreement** and select on the link for your particular Operating System. Choose **Windows** Operating System to download the **.exe** installation file (do not download.zip/tar.z/tar.gz/.rpm extension files).

### Java SE Development Kit 8u191

You must accept the [Oracle Binary Code License Agreement for Java SE](#) to download this software.

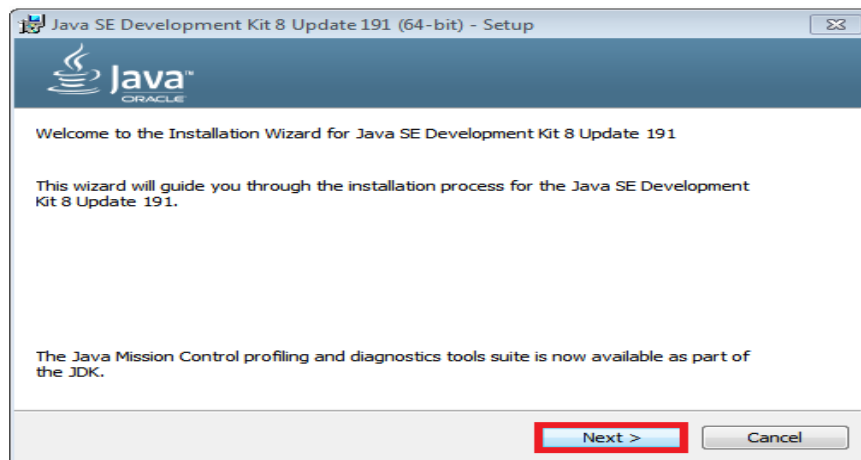
☒ **Accept License Agreement**
☐ Decline License Agreement

Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	72.97 MB	<a href="#">jdk-8u191-linux-arm32-vfp-hflt.tar.gz</a>
Linux ARM 64 Hard Float ABI	69.92 MB	<a href="#">jdk-8u191-linux-arm64-vfp-hflt.tar.gz</a>
Linux x86	170.89 MB	<a href="#">jdk-8u191-linux-i586.rpm</a>
Linux x86	185.69 MB	<a href="#">jdk-8u191-linux-i586.tar.gz</a>
Linux x64	167.99 MB	<a href="#">jdk-8u191-linux-x64.rpm</a>
Linux x64	182.87 MB	<a href="#">jdk-8u191-linux-x64.tar.gz</a>
Mac OS X x64	245.92 MB	<a href="#">jdk-8u191-macosx-x64.dmg</a>
Solaris SPARC 64-bit (SVR4 package)	133.04 MB	<a href="#">jdk-8u191-solaris-sparcv9.tar.Z</a>
Solaris SPARC 64-bit	94.28 MB	<a href="#">jdk-8u191-solaris-sparcv9.tar.gz</a>
Solaris x64 (SVR4 package)	134.04 MB	<a href="#">jdk-8u191-solaris-x64.tar.Z</a>
Solaris x64	92.13 MB	<a href="#">jdk-8u191-solaris-x64.tar.gz</a>
Windows x86	197.34 MB	<a href="#">jdk-8u191-windows-i586.exe</a>
Windows x64	207.22 MB	<a href="#">jdk-8u191-windows-x64.exe</a>

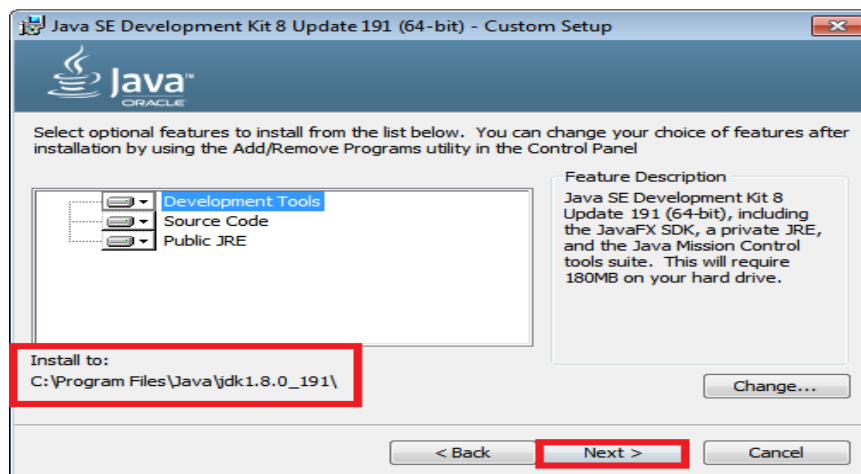
Once the file is saved, use your Windows Explorer to find and run the program by double-clicking on.exe file. Depending on your version of Windows and security settings you may get a security popup. Click on **Run** or **OK** to continue.

When setup is launched you should see the following screen as shown below,

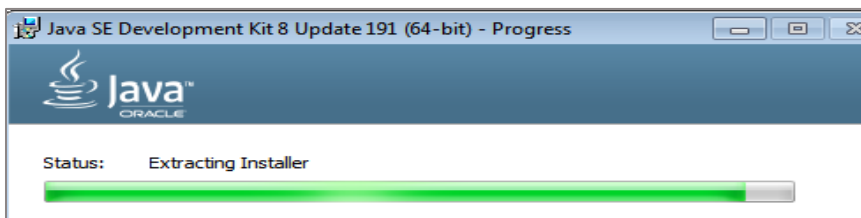
Click on **Next** to continue.



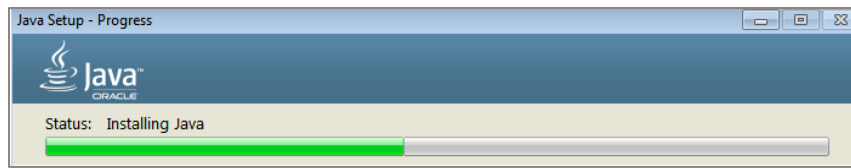
You can accept the default values and simply click on **Next** button to continue. There is no need to make any changes on this screen.



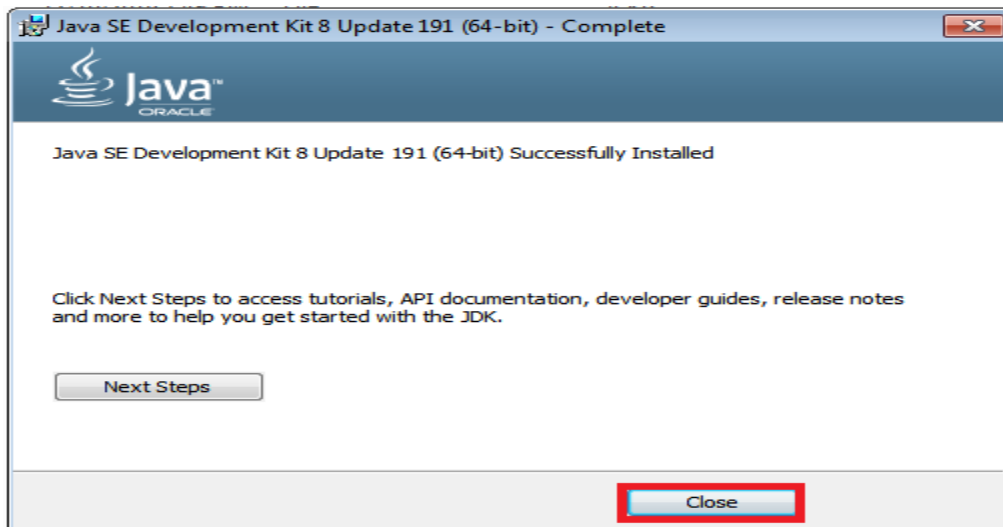
The JRE is automatically installed as a part of the JDK, and you will use the **Install to:** path to access both JRE and JDK components.



The next screen will display a simple progress bar while the JDK files are being installed.



When the JDK is finished installing, you should see a confirmation page similar to the one below. Simply click the **Close** button to finish.



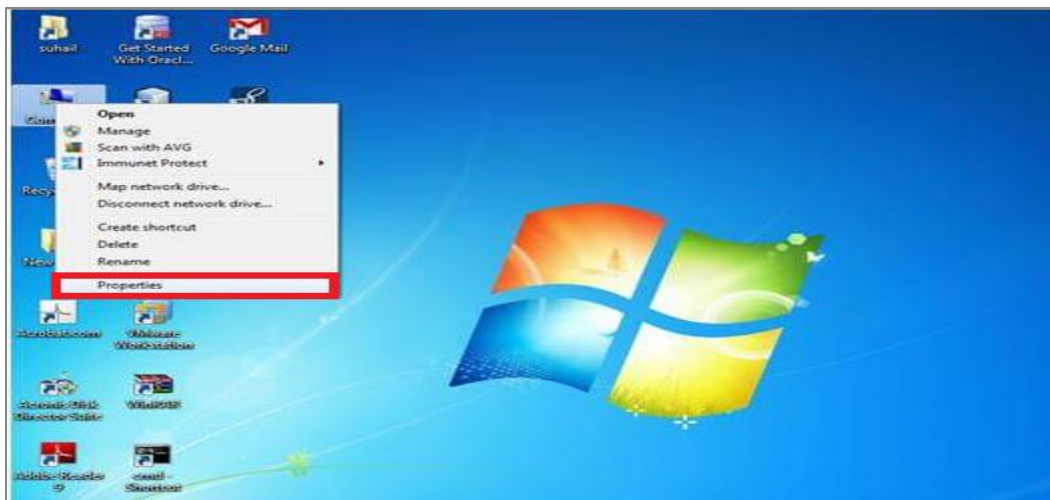
You have to set the path for using tools such as javac, java, etc.

There are two ways to set the path in Java,

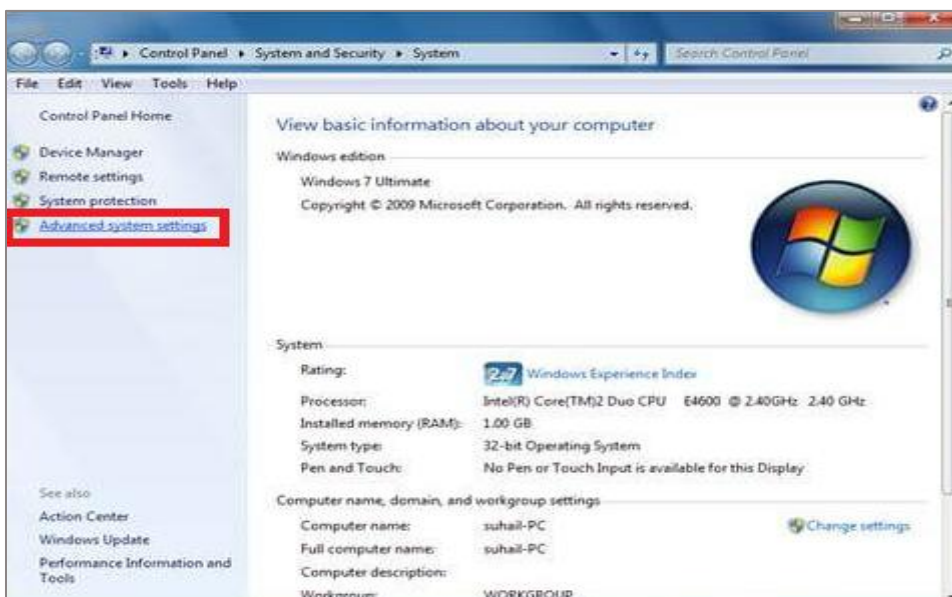
- Temporary
- Permanent

## Step #2 | Set Permanent Path of JDK in Windows

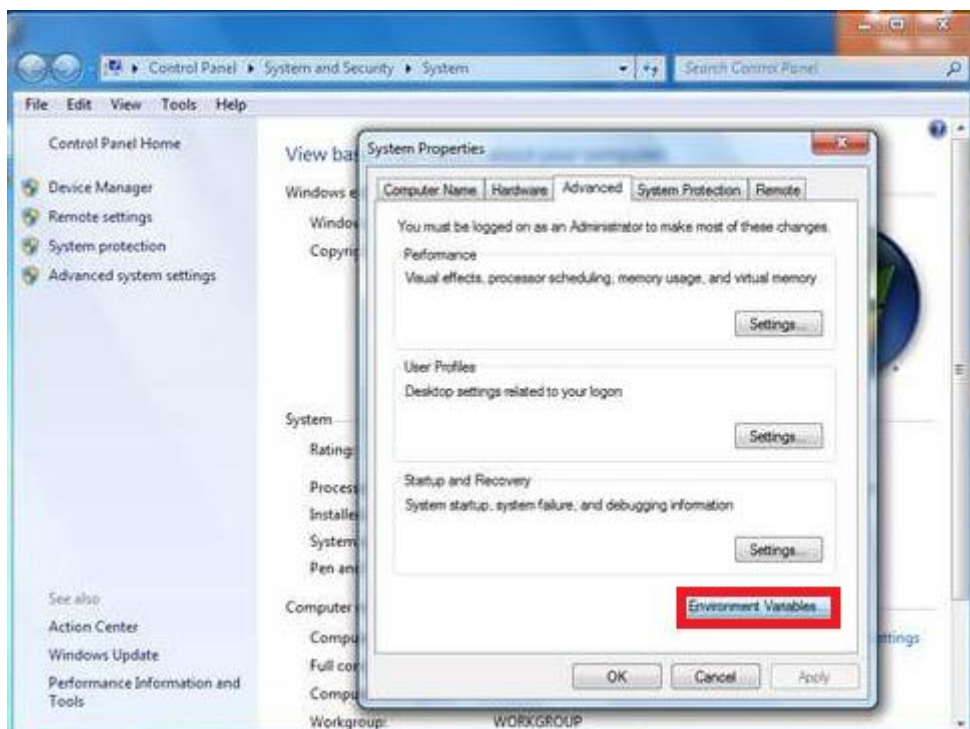
Go to My Computer **Properties** on your desktop.



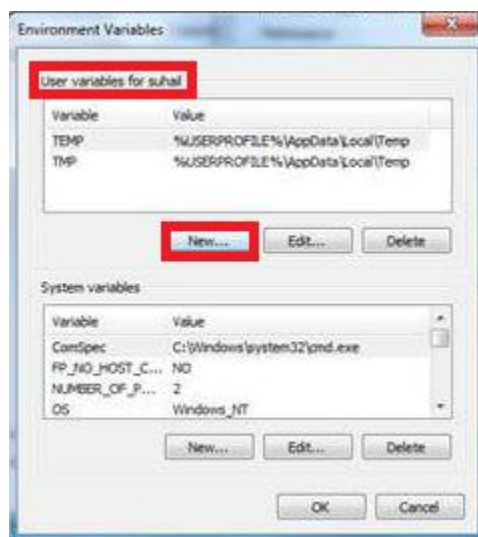
Click on the **Advanced systems settings** tab.



It displays a pop-up with all the system properties. Click on **Environment Variables**.



In the Environment Variables, click on the **New...** tab of User variables.



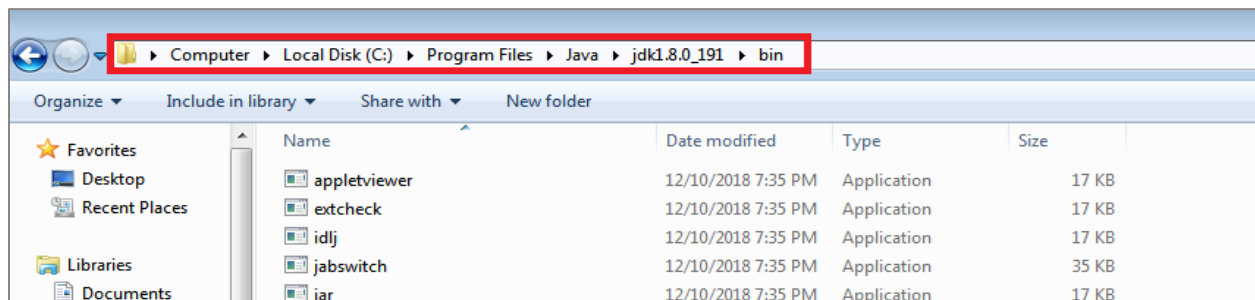
Provide the variable name as **path**.



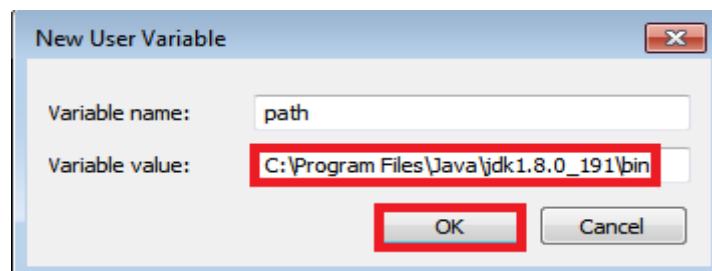


In your system, Local Disk (C) --> Program Files --> Java --> jdk1.8.0\_191--> bin.

Now, copy the path from the address bar as shown below.



Go back to the User Variables, Paste the path of bin folder in the Variable value and click on **OK** as shown below.



You will be redirected back to Environment Variables, click on **OK**.



Now, you can see the pop-up for System Properties. Click on **OK**.



Finally, your permanent Java path is successfully set.

**Note:** To check if Java is successfully installed on your system or not. Go to command prompt and give command **java -version**

## Step #3 | Maven Installation on Windows

Maven is written in Java (and primarily used to build Java programs). Thus, the major pre-requisite is the Java SDK and you should install it to a pathname.

Simply pick a ready-made binary distribution archive from the following link, <https://maven.apache.org/download.cgi>. Download **Binary zip archive** as shown below

Files			
Maven is distributed in several formats for your convenience. Simply pick a ready-made binary distribution archive and follow the <a href="#">installation instructions</a> . Use a source archive if you intend to build Maven yourself.			
In order to guard against corrupted downloads/installations, it is highly recommended to <a href="#">verify the signature</a> of the release bundles against the public <a href="#">KEYS</a> used by the Apache Maven developers.			
	Link	Checksums	Signature
Binary tar.gz archive	<a href="#">apache-maven-3.6.0-bin.tar.gz</a>	<a href="#">apache-maven-3.6.0-bin.tar.gz.sha512</a>	<a href="#">apache-maven-3.6.0-bin.tar.gz.asc</a>
Binary zip archive	<a href="#">apache-maven-3.6.0-bin.zip</a>	<a href="#">apache-maven-3.6.0-bin.zip.sha512</a>	<a href="#">apache-maven-3.6.0-bin.zip.asc</a>
Source tar.gz archive	<a href="#">apache-maven-3.6.0-src.tar.gz</a>	<a href="#">apache-maven-3.6.0-src.tar.gz.sha512</a>	<a href="#">apache-maven-3.6.0-src.tar.gz.asc</a>
Source zip archive	<a href="#">apache-maven-3.6.0-src.zip</a>	<a href="#">apache-maven-3.6.0-src.zip.sha512</a>	<a href="#">apache-maven-3.6.0-src.zip.asc</a>

## Step #4 | Setting Maven Path on Windows

Unpack the Maven distribution in any one of the drive on your local machine. Extract the .zip file into a specified folder with the same name.

This PC > Local Disk (E:) > softwares > apache-maven-3.5.3				
Name	Date modified	Type	Size	
apache-maven-3.5.3	10/20/2017 10:37 ...	File folder		

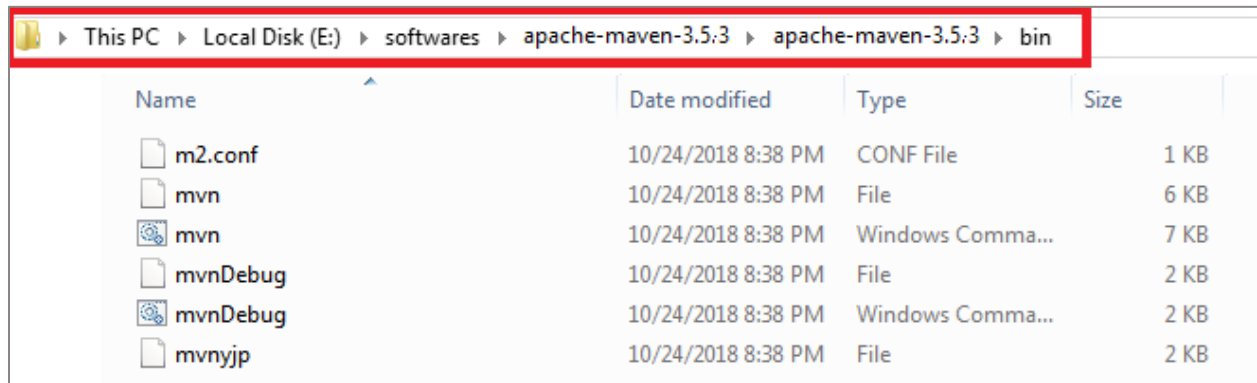
Run the Maven by invoking a command-line tool: **mvn.cmd** from the bin directory of the Maven.

This PC > Local Disk (E:) > softwares > apache-maven-3.5.3 > apache-maven-3.5.3 > bin				
Name	Date modified	Type	Size	
m2.conf	10/24/2018 8:38 PM	CONF File	1 KB	
mvn	10/24/2018 8:38 PM	File	6 KB	
mvn	10/24/2018 8:38 PM	Windows Comma...	7 KB	
mvnDebug	10/24/2018 8:38 PM	File	2 KB	
mvnDebug	10/24/2018 8:38 PM	Windows Comma...	2 KB	
mvnyjp	10/24/2018 8:38 PM	File	2 KB	

Double click on **mvn** and run the Maven software.

Open the Environment Variables as shown in **Step #2 | Set permanent path of JDK in Windows**.

Goto the folder where you had extracted Maven and copy the Maven path upto **\bin**



Now go back to Environmental variables and set User Variables with the above path and click on **OK**.

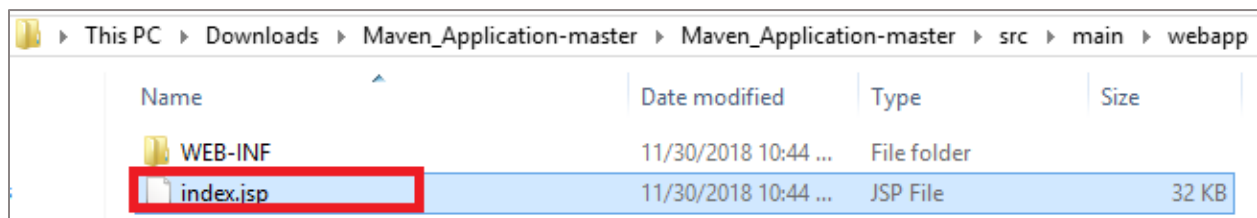
Open your command prompt (cmd) and give the command **mvn -version**.

```
C:\Users\> mvn -version
Apache Maven 3.5.3 (ff8f5e/444045639af65f6095c62210b5713f426; 2017-04-04T01:09:06+05:30)
Maven home: E:\softwares\apache-maven-3.5.3\apache-maven-3.5.3\bin\..
Java version: 1.8.0_121, vendor: Oracle Corporation
Java home: C:\Program Files\Java\jre1.8.0_121
Default locale: en_US, platform encoding: Cp1252
OS name: "windows 8.1", version: "6.3", arch: "amd64", family: "windows"
C:\Users\>
```

In the above screenshot, Apache Maven version is 3.5.3

## Step #5 | Create .war File

After installing Maven on your system, open source code which you have downloaded from GitHub and open **index.jsp** file through notepad, which is in the path: **src--> main--> webapp**

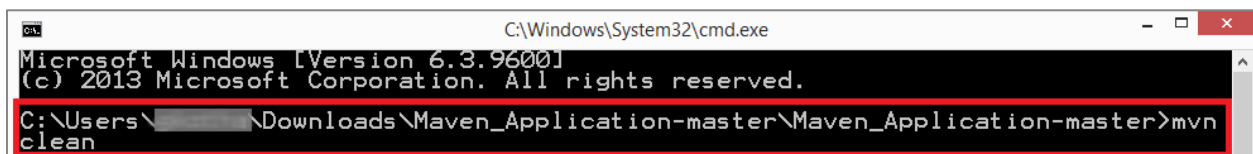


Provide the details of your Database Server i.e, URL, Port, Database Name Username, and Password and save the file.

```
<%
try
{
    Class.forName("com.mysql.jdbc.Driver");
    String url="jdbc:mysql://digitalsummit.cwyafhmsarvs.us-east-1.rds.amazonaws.com:3306/miracle?useSSL=false";
    String username="miracle";
    String password="Miracle123";
    String query="select * from tblDS18Colleges";

    Connection conn=DriverManager.getConnection(url, username, password);
    Statement stmt=conn.createStatement();
    ResultSet rs=stmt.executeQuery(query);
    while(rs.next())
    {
%>
```

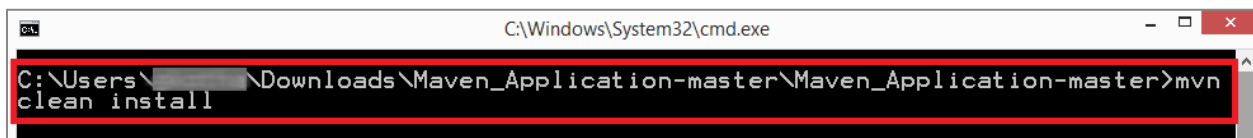
Open command line interface and set the path to your application. Enter the command **mvn clean** which executes Maven, and its build life cycle named clean.



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\<redacted>\Downloads\Maven_Application-master\Maven_Application-master>mvn
clean
```

Enter the **mvn clean package** or **mvn clean install** to execute your Maven application.



```
C:\Windows\System32\cmd.exe
C:\Users\<redacted>\Downloads\Maven_Application-master\Maven_Application-master>mvn
clean install
```

The target folder will be created and in that, you can find your application's **.war** file.

Now, it's time to access your application through **Tomcat**.

Give your EC2 instance IP address where your Tomcat is installed along with Port in your browser. Now, provide your Username and Password to open the **Manager App**.

After opening **Manager App** page, you will get the list of all deployed contexts.

← → ↻ 🏠 18.206.186.27/manager/html ... ☆ 🔍 Search 📄

## 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
/manager	None specified	Tomcat Manager Application	true	2	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Scroll down to upload the **.war** file of your application, click on **Choose File** as shown below.

**Deploy**

Deploy directory or WAR file located on server

Context Path (required):

XML Configuration file URL:

WAR or Directory URL:

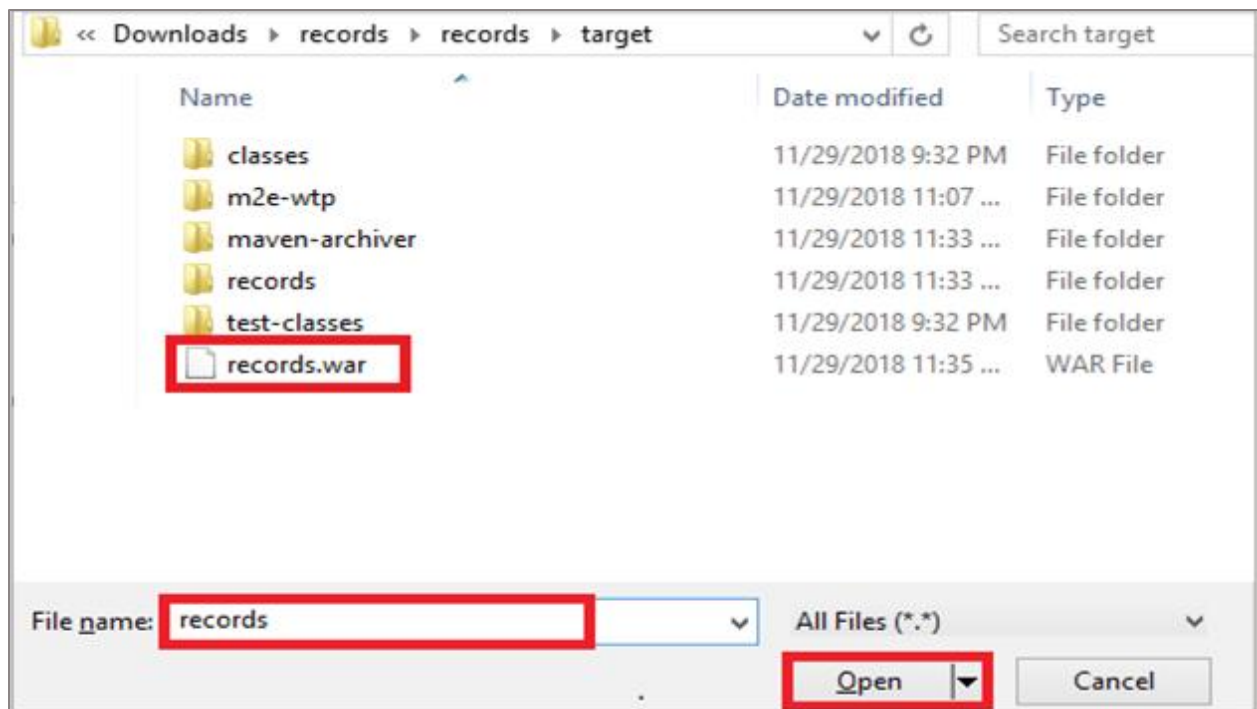
Deploy

**WAR file to deploy**

Select WAR file to upload **Choose File** No file chosen

Deploy

Select **.war** file from the application folder in your local machine.



Click on **Deploy**.

Deploy	
Deploy directory or WAR file located on server	
Context Path (required):	<input type="text"/>
XML Configuration file URL:	<input type="text"/>
WAR or Directory URL:	<input type="text"/>
<input type="button" value="Deploy"/>	
WAR file to deploy	
Select WAR file to upload	<input type="button" value="Choose File"/> records.war
<input type="button" value="Deploy"/>	

After deployment of your **.war** file, you will get **/records** in the deployed contexts as shown below.

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
/manager	None specified	Tomcat Manager Application	true	2	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
<b>/records</b>	None specified	Archetype Created Web Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Click on **/records** to access your application in your browser as shown below.

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#	CollegeName	District
1	A S R College Of Engineering And Technology	East Godavari
2	Adarsh College of Engineering	East Godavari
3	Aditya Engineering College	East Godavari
4	Amalapuram Institute of Management Science & College of Engineering	East Godavari
5	B.V.C College of Engineering	East Godavari
6	Chaitanya Inst. of Eng. and Technology	East Godavari
7	GIET College of Engineering	East Godavari
8	Ideal Institute of Technology	East Godavari
9	International School of Technology & Sciences (Women)	East Godavari
10	JNTU College of Engineering	East Godavari
11	Kakinada Institute of Engineering & Technology	East Godavari
12	Konaseema Institute of Mgt. Sciences & College of Engineering	East Godavari
13	Krishnas Pragati Institute of Technology	East Godavari

For any questions regarding the lab please feel free to reach out to [innovation@miraclesoft.com](mailto:innovation@miraclesoft.com). We hope you enjoyed this!