

EJB - CREATE APPLICATION

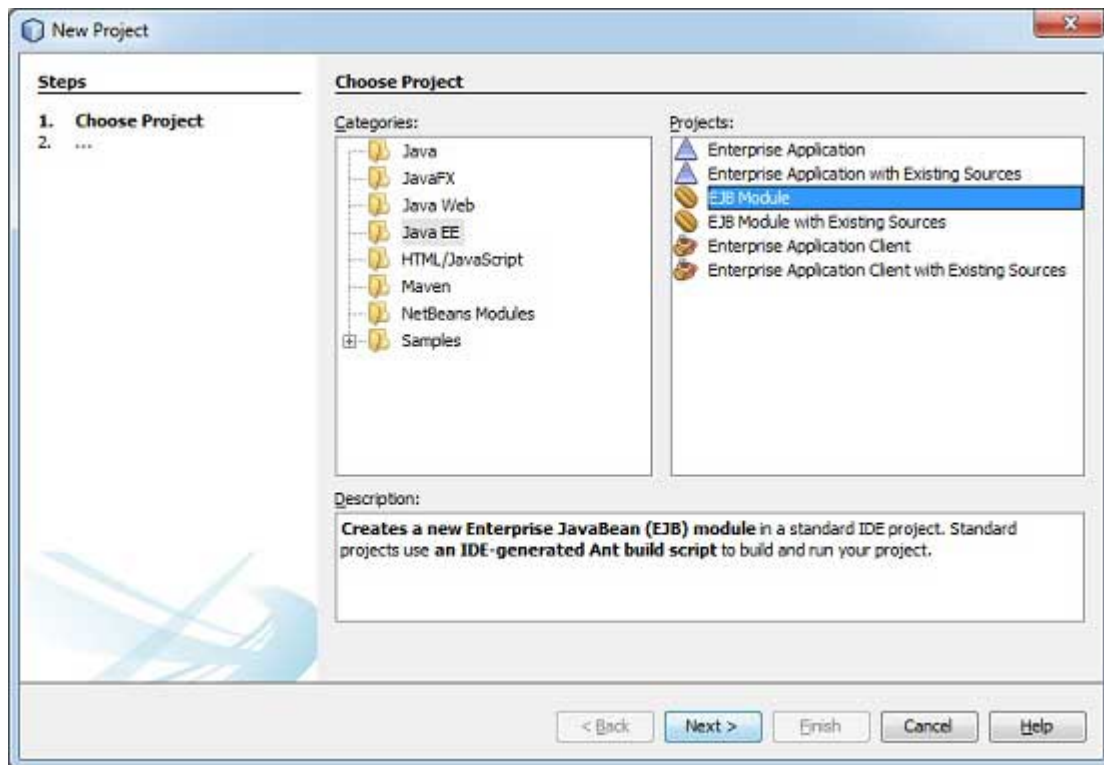
http://www.tutorialspoint.com/ejb/ejb_create_application.htm

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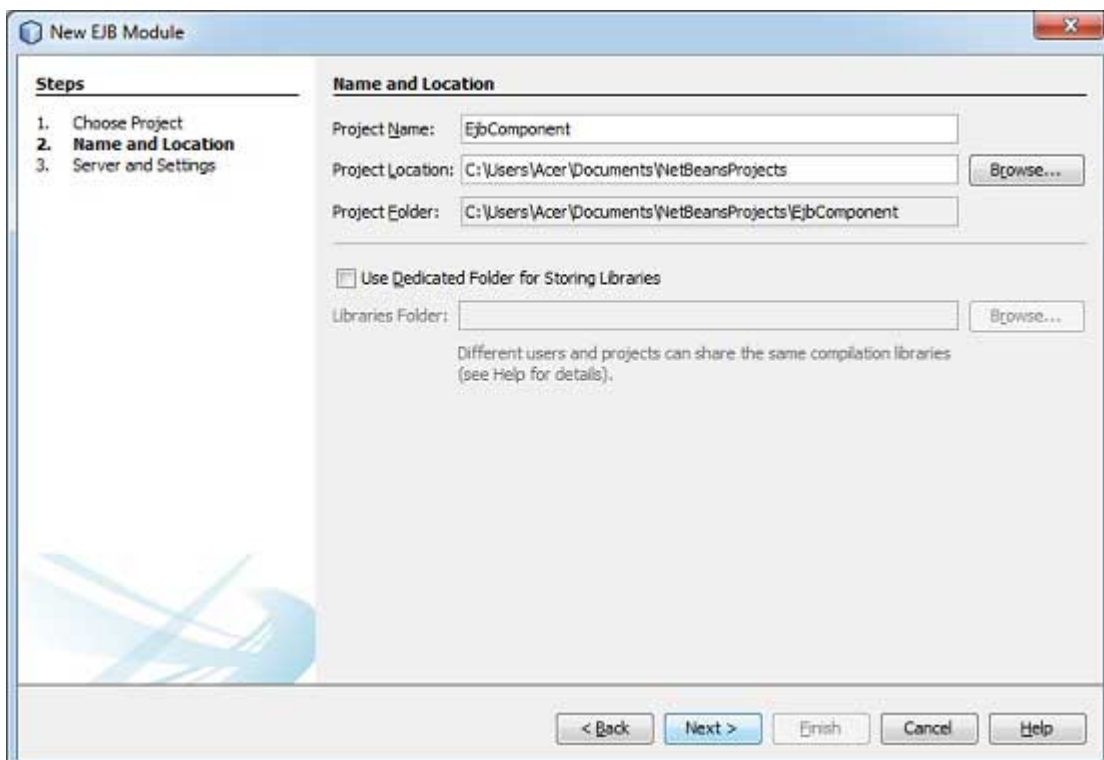
To create a simple EJB module, we'll use NetBeans "New project" wizard. In example below, We'll create a ejb module project named Component.

Create Project

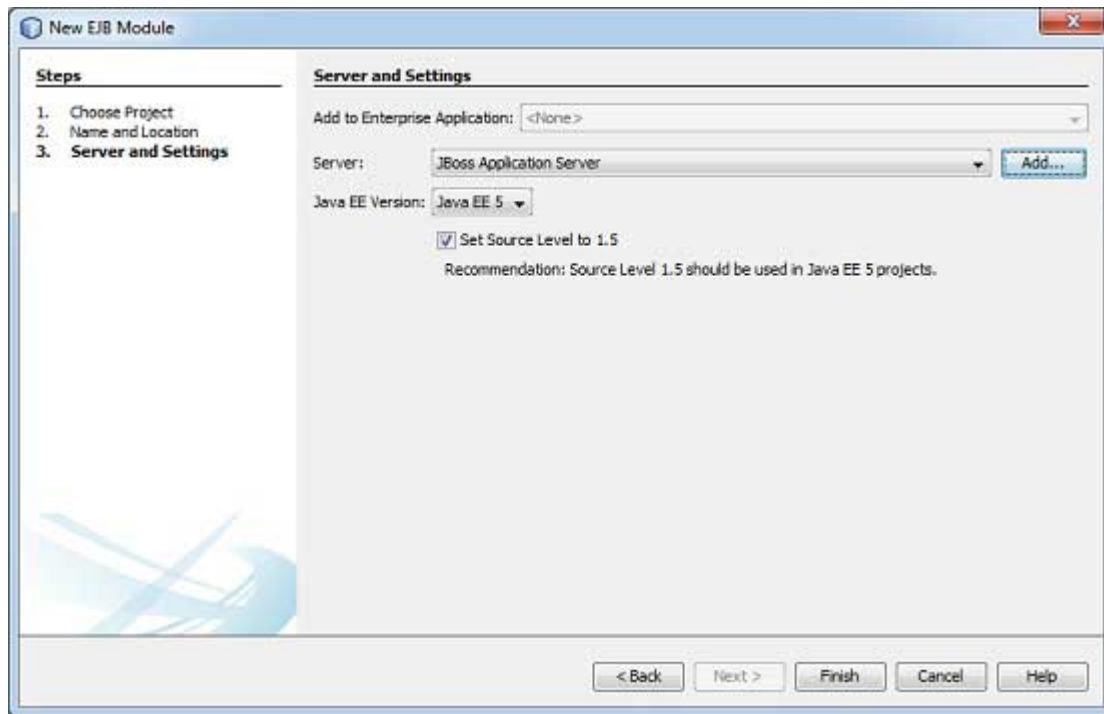
In NetBeans IDE, select **File > New Project >**. You'll see the following screen.



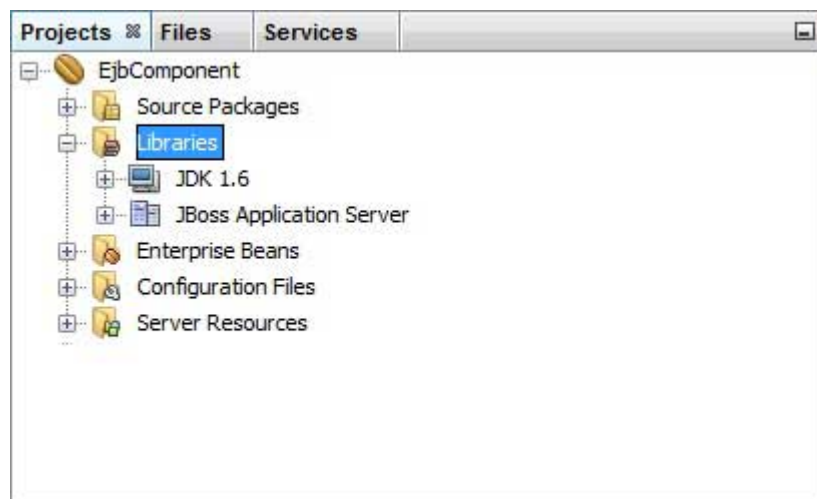
Select project type under category, **Java EE**, Project type as **Ejb Module**. Click **Next >** button. You'll see the following screen.



Enter project name and location. Click **Next >** button. You'll see the following screen.



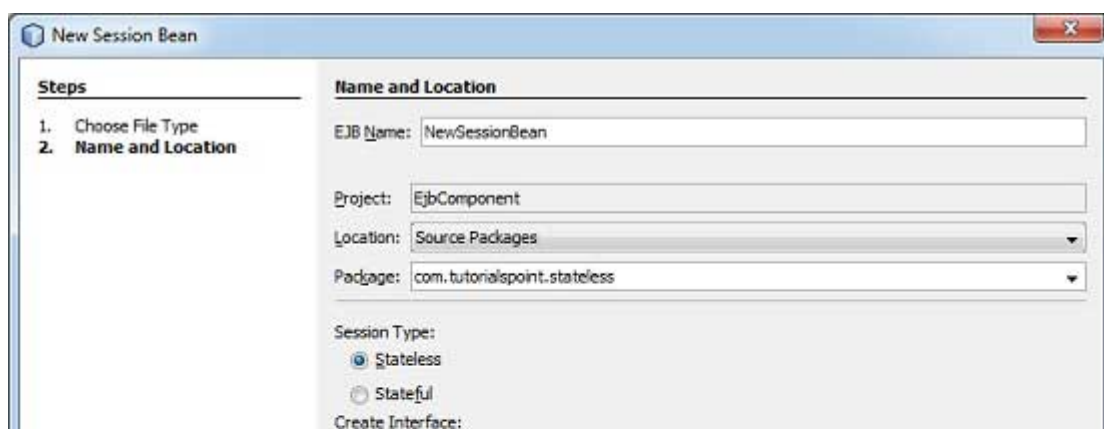
Select Server as **JBoss Application Server**. Click **Finish** button. You'll see the following project created by NetBeans.

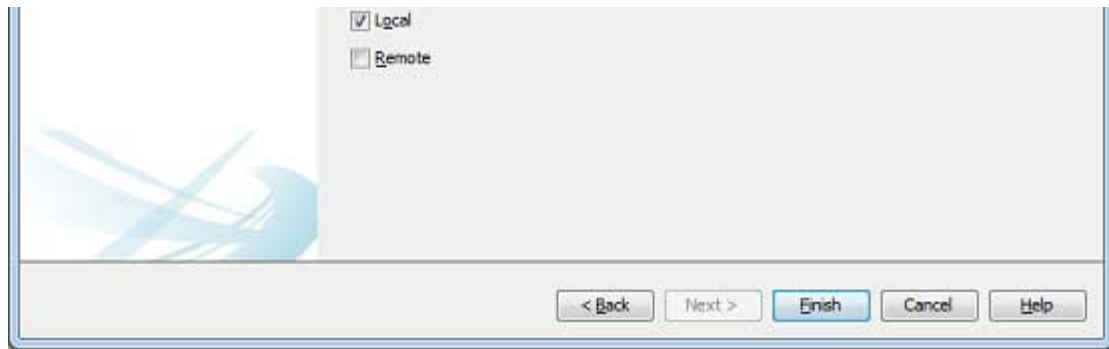


Create a sample EJB

To create a simple EJB, we'll use NetBeans "New" wizard. In example below, We'll create a stateless ejb class named librarySessionBean under EjbComponent project.

Select project EjbComponent in project explorer window and right click on it. Select, **New > Session Bean**. You'll see the **New Session Bean** wizard.





Enter session bean name and package name. Click **Finish** button. You'll see the following ejb classes created by NetBeans.

- **LibrarySessionBean** - stateless session bean
- **LibrarySessionBeanLocal** - local interface for session bean

I am changing local interface to remote interface as we're going to access our ejb in a console based application. Remote/Local interface are used to expose business methods that an ejb has to implement.

LibrarySessionBeanLocal is renamed to LibrarySessionBeanRemote and LibrarySessionBean implements LibrarySessionBeanRemote interface.

LibrarySessionBeanRemote

```
package com.tutorialspoint.stateless;

import java.util.List;
import javax.ejb.Remote;

@Remote
public interface LibrarySessionBeanRemote {

    void addBook(String bookName);

    List getBooks();

}
```

LibrarySessionBean

```
package com.tutorialspoint.stateless;

import java.util.ArrayList;
import java.util.List;
import javax.ejb.Stateless;

@Stateless
public class LibrarySessionBean implements LibrarySessionBeanRemote {

    List<String> bookShelf;

    public LibrarySessionBean(){
        bookShelf = new ArrayList<String>();
    }

    public void addBook(String bookName) {
        bookShelf.add(bookName);
    }

    public List<String> getBooks() {
        return bookShelf;
    }

}
```

Build the Project

- Select EjbComponent project in Project Explorer window
- Right click on it to open context menu.
- Select clean and build.

You'll see the following output in NetBeans console output.

```
ant -f C:\EJB\EjbComponent clean dist
init:
undeploy-clean:
deps-clean:
Deleting directory C:\EJB\EjbComponent\build
Deleting directory C:\EJB\EjbComponent\dist
clean:
init:
deps-jar:
Created dir: C:\EJB\EjbComponent\build\classes
Copying 3 files to C:\EJB\EjbComponent\build\classes\META-INF
Created dir: C:\EJB\EjbComponent\build\empty
Created dir: C:\EJB\EjbComponent\build\generated-sources\ap-source-output
Compiling 2 source files to C:\EJB\EjbComponent\build\classes
warning: [options] bootstrap class path not set in conjunction with -source 1.6
Note: C:\EJB\EjbComponent\src\java\com\tutorialspoint\stateless
\LibraryPersistentBean.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
1 warning
compile:
library-inclusion-in-archive:
Created dir: C:\EJB\EjbComponent\dist
Building jar: C:\EJB\EjbComponent\dist\EjbComponent.jar
dist:
BUILD SUCCESSFUL (total time: 3 seconds)
```

Start the Application Server

- Select JBoss application server under Servers in Services window
- Right click on it to open context menu.
- Select start.

You'll see the following output in NetBeans ,output under JBoss Application Server .

```
Calling C:\jboss-5.1.0.GA\bin\run.conf.bat
=====

JBoss Bootstrap Environment

JBOSS_HOME: C:\jboss-5.1.0.GA

JAVA: C:\Program Files (x86)\Java\jdk1.6.0_21\bin\java

JAVA_OPTS: -Dprogram.name=run.bat -Xms128m -Xmx512m -server

CLASSPATH: C:\jboss-5.1.0.GA\bin\run.jar

=====

16:25:50,062 INFO  [ServerImpl] Starting JBoss (Microcontainer)...
16:25:50,062 INFO  [ServerImpl] Release ID: JBoss [The Oracle] 5.1.0.GA (build:
SVNTag=JBoss_5_1_0_GA date=200905221634)
...

16:26:40,420 INFO  [TomcatDeployment] deploy, ctxPath=/admin-console
16:26:40,485 INFO  [config] Initializing Mojarra (1.2_12-b01-FCS) for context '/admin-
```

```

console'
16:26:42,362 INFO  [TomcatDeployment] deploy, ctxPath=/
16:26:42,406 INFO  [TomcatDeployment] deploy, ctxPath=/jmx-console
16:26:42,471 INFO  [Http11Protocol] Starting Coyote HTTP/1.1 on http-127.0.0.1-8080
16:26:42,487 INFO  [AjpProtocol] Starting Coyote AJP/1.3 on ajp-127.0.0.1-8009
16:26:42,493 INFO  [ServerImpl] JBoss (Microcontainer) [5.1.0.GA (build:
SVNTag=JBoss_5_1_0_GA date=200905221634)] Started in 52s:427ms

```

Deploy the Project

- Select EjbComponent project in Project Explorer window
- Right click on it to open context menu.
- Select Deploy.

You'll see the following output in NetBeans console output.

```

ant -f C:\EJB\EjbComponent -DforceRedeploy=true -Ddirectory.deployment.supported=false
-Dnb.wait.for.caches=true run
init:
deps-jar:
compile:
library-inclusion-in-archive:
Building jar: C:\EJB\EjbComponent\dist\EjbComponent.jar
dist-directory-deploy:
pre-run-deploy:
Checking data source definitions for missing JDBC drivers...
Distributing C:\EJB\EjbComponent\dist\EjbComponent.jar to
[org.jboss.deployment.spi.LocalhostTarget@1e4f84ee]
Deploying C:\EJB\EjbComponent\dist\EjbComponent.jar
Applicaton Deployed
Operation start started
Operation start completed
post-run-deploy:
run-deploy:
run:
BUILD SUCCESSFUL (total time: 2 seconds)

```

JBoss Application server log output

```

16:30:00,963 INFO  [DeployHandler] Begin start, [EjbComponent.jar]
...
16:30:01,233 INFO  [Ejb3DependenciesDeployer] Encountered deployment
AbstractVFSDeploymentContext@12038795{vfszip:/C:/jboss-5.1.0.GA/server/default/deploy/Ej
bComponent.jar/}
...
16:30:01,281 INFO  [JBossASKernel]
jndi:LibrarySessionBean/remote-com.tutorialspoint.stateless.LibrarySessionBeanRemote
16:30:01,281 INFO  [JBossASKernel]
Class:com.tutorialspoint.stateless.LibrarySessionBeanRemote
16:30:01,281 INFO  [JBossASKernel] jndi:LibrarySessionBean/remote
16:30:01,281 INFO  [JBossASKernel] Added bean(jboss.j2ee:jar=EjbComponent.jar,name=
LibrarySessionBean,service=EJB3) to KernelDeployment of: EjbComponent.jar
16:30:01,282 INFO  [JBossASKernel] installing bean:
jboss.j2ee:jar=EjbComponent.jar,name=BookMessageHandler,service=EJB3
16:30:01,282 INFO  [JBossASKernel] with dependencies:
16:30:01,282 INFO  [JBossASKernel] and demands:
16:30:01,282 INFO  [JBossASKernel] jboss.ejb:service=EJBTimerService
...
16:30:01,283 INFO  [EJB3EndpointDeployer] Deploy
AbstractBeanMetaData@5497cb{name=jboss.j2ee:jar=EjbComponent.jar, name=LibrarySessionBean,
service=EJB3_endpoint bean=org.jboss.ejb3.endpoint.deployers.impl.EndpointImpl
properties=[container] constructor=null autowireCandidate=true}
...
16:30:01,394 INFO  [SessionSpecContainer] Starting
jboss.j2ee:jar=EjbComponent.jar,name=LibrarySessionBean,service=EJB3
16:30:01,395 INFO  [EJBContainer] STARTED EJB:

```

```

com.tutorialspoint.stateless.LibrarySessionBean ejbName: LibrarySessionBean
16:30:01,401 INFO [JndiSessionRegistrarBase] Binding the following Entries in Global
JNDI:
    LibrarySessionBean/remote - EJB3.x Default Remote Business Interface
    LibrarySessionBean/remote-com.tutorialspoint.stateless.LibrarySessionBeanRemote -
EJB3.x Remote Business Interface
16:30:02,723 INFO [SessionSpecContainer] Starting
jboss.j2ee:jar=EjbComponent.jar,name=LibrarySessionBean,service=EJB3
16:30:02,723 INFO [EJBContainer] STARTED EJB:
com.tutorialspoint.stateless.LibrarySessionBean ejbName: LibrarySessionBean
16:30:02,731 INFO [JndiSessionRegistrarBase] Binding the following Entries in Global
JNDI:
    LibrarySessionBean/remote - EJB3.x Default Remote Business Interface
    LibrarySessionBean/remote-com.tutorialspoint.stateless.LibrarySessionBeanRemote -
EJB3.x Remote Business Interface

```

Create Client to access EJB

- In NetBeans IDE, select **File > New Project >**.
- Select project type under category **Java**, Project type as **Java Application**. Click **Next >** button.
- Enter project name and location. Click **Finish >** button. We've chosen name as EjbTester.
- Right click on project name in Project explorer window. Select **properties**.
- Add ejb component project created earlier under libraries using **Add Project** button in **compile** tab.
- Add jboss libraries using **Add jar/folder** button in **compile** tab. Jboss libraries can be located at <jboss installation folder>> client folder.

create jndi.properties under project say EjbTester.

jndi.properties

```

java.naming.factory.initial=org.jnp.interfaces.NamingContextFactory
java.naming.factory.url.pkgs=org.jboss.naming:org.jnp.interfaces
java.naming.provider.url=localhost

```

Create package com.tutorialspoint.test and EJBTester.java class under it.

EJBTester.java

```

package com.tutorialspoint.test;

import com.tutorialspoint.stateless.LibrarySessionBeanRemote;
import java.io.BufferedReader;
import java.io.FileInputStream;
import java.io.IOException;
import java.io.InputStreamReader;
import java.util.List;
import java.util.Properties;
import javax.naming.InitialContext;
import javax.naming.NamingException;

public class EJBTester {

    BufferedReader brConsoleReader = null;
    Properties props;
    InitialContext ctx;
    {
        props = new Properties();
        try {

```

```

    props.load(new FileInputStream("jndi.properties"));
} catch (IOException ex) {
    ex.printStackTrace();
}
try {
    ctx = new InitialContext(props);
} catch (NamingException ex) {
    ex.printStackTrace();
}
brConsoleReader =
    new BufferedReader(new InputStreamReader(System.in));
}
public static void main(String[] args) {

    EJBTester ejbTester = new EJBTester();

    ejbTester.testStatelessEjb();
}
private void showGUI(){
    System.out.println("*****");
    System.out.println("Welcome to Book Store");
    System.out.println("*****");
    System.out.print("Options \n1. Add Book\n2. Exit \nEnter Choice: ");
}
private void testStatelessEjb(){
    try {
        int choice = 1;
        LibrarySessionBeanRemote libraryBean =
            (LibrarySessionBeanRemote)ctx.lookup("LibrarySessionBean/remote");
        while (choice != 2) {
            String bookName;
            showGUI();
            String strChoice = brConsoleReader.readLine();
            choice = Integer.parseInt(strChoice);
            if (choice == 1) {
                System.out.print("Enter book name: ");
                bookName = brConsoleReader.readLine();
                libraryBean.addBook(bookName);
            }else if (choice == 2) {
                break;
            }
        }
        List<String> booksList = libraryBean.getBooks();
        System.out.println("Book(s) entered so far: " + booksList.size());
        for (int i = 0; i < booksList.size(); ++i) {
            System.out.println((i+1)+" ". + booksList.get(i));
        }
        LibrarySessionBeanRemote libraryBean1 =
            (LibrarySessionBeanRemote)ctx.lookup("LibrarySessionBean/remote");
        List<String> booksList1 = libraryBean1.getBooks();
        System.out.println(
            "****Using second lookup to get library stateless object****");
        System.out.println(
            "Book(s) entered so far: " + booksList1.size());
        for (int i = 0; i < booksList1.size(); ++i) {
            System.out.println((i+1)+" ". + booksList1.get(i));
        }
    } catch (Exception e) {
        System.out.println(e.getMessage());
        e.printStackTrace();
    }finally {
        try {
            if(brConsoleReader !=null){
                brConsoleReader.close();
            }
        } catch (IOException ex) {
            System.out.println(ex.getMessage());
        }
    }
}

```

```
}  
}
```

Run Client to access EJB

Locate EJBTester.java in project explorer. Right click on EJBTester class and select **run file**.

Verify the following output in Netbeans console.

```
run:  
*****  
Welcome to Book Store  
*****  
Options  
1. Add Book  
2. Exit  
Enter Choice: 1  
Enter book name: Learn Java  
*****  
Welcome to Book Store  
*****  
Options  
1. Add Book  
2. Exit  
Enter Choice: 2  
Book(s) entered so far: 1  
1. Learn Java  
***Using second lookup to get library stateless object***  
Book(s) entered so far: 0  
BUILD SUCCESSFUL (total time: 13 seconds)
```

In following chapters, we'll cover multiple aspects of this complete ejb application.