

1. Deben crear un proyecto maven con los siguientes parámetros:

a. Creamos el proyecto

```
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> mvn archetype:generate
```

b. Definimos los parametros asignados

```
Define value for property 'groupId': edu.eci.cvds
Define value for property 'artifactId': Library
Define value for property 'version' 1.0-SNAPSHOT:
Define value for property 'package' edu.eci.cvds: edu.eci.cvds.tdd
Confirm properties configuration:
groupId: edu.eci.cvds
artifactId: Library
version: 1.0-SNAPSHOT
package: edu.eci.cvds.tdd
Y: N
Define value for property 'groupId': edu.eci.cvds
Define value for property 'artifactId': maven-archetype-quickstart
Define value for property 'version' 1.0-SNAPSHOT:
Define value for property 'package' edu.eci.cvds: edu.eci.cvds.tdd
Confirm properties configuration:
groupId: edu.eci.cvds
artifactId: maven-archetype-quickstart
version: 1.0-SNAPSHOT
package: edu.eci.cvds.tdd
Y: Y
```

```
[INFO] -----
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-quickstart:1.0
[INFO] -----
[INFO] Parameter: basedir, Value: C:\Users\Esteban Aguilera
[INFO] Parameter: package, Value: edu.eci.cvds.tdd
[INFO] Parameter: groupId, Value: edu.eci.cvds
[INFO] Parameter: artifactId, Value: maven-archetype-quickstart
[INFO] Parameter: packageName, Value: edu.eci.cvds.tdd
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: C:\Users\Esteban Aguilera\maven-archetype-quickstart
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 01:24 min
[INFO] Finished at: 2025-02-06T13:40:19-05:00
[INFO] -----
PS C:\Users\Esteban Aguilera> |
```

## AGREGAR DEPENDENCIA JUNIT 5

1. Buscar en maven central la dependencia de JUnit5 en su versión más reciente.

a. Buscamos en Maven central la dependencia mas cercana a Junit5

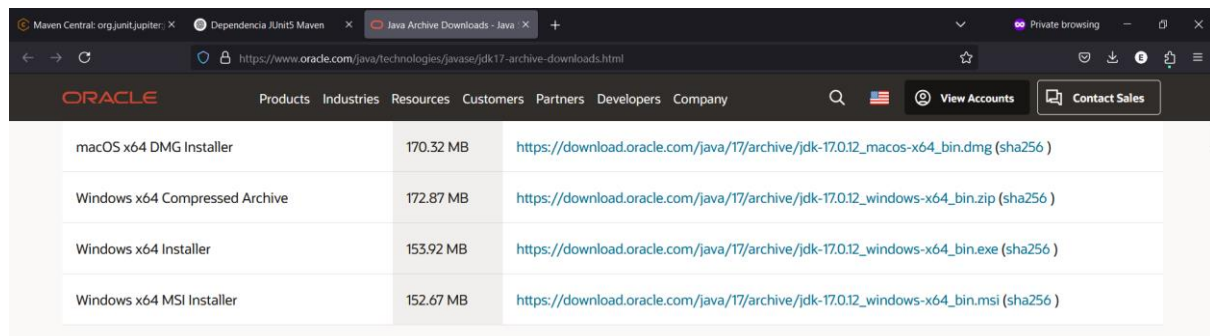
2. Edite el archivo pom.xml del proyecto para agregar la dependencia.

- a. Agregamos la dependencia en el pom.xml

```
1 <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
2   xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4_0_0.xsd">
3   <modelVersion>4.0.0</modelVersion>
4   <groupId>edu.eci.cvds</groupId>
5   <artifactId>maven-archetype-quickstart</artifactId>
6   <packaging>jar</packaging>
7   <version>1.0-SNAPSHOT</version>
8   <name>maven-archetype-quickstart</name>
9   <url>http://maven.apache.org</url>
10  <dependencies>
11    <dependency>
12      <groupId>org.junit.jupiter</groupId>
13      <artifactId>junit-jupiter</artifactId>
14      <version>5.12.0-M1</version>
15    </dependency>
16  </dependencies>
17  <properties>
18    <maven.compiler.target>1.8</maven.compiler.target>
19    <maven.compiler.source>1.8</maven.compiler.source>
20  </properties>
21 </project>
22
```

3. Verifique que la versión de java sea la 17

- a. Instalamos la versión 17 de java



Platform	Size	Download Link
macOS x64 DMG Installer	170.32 MB	<a href="https://download.oracle.com/java/17/archive/jdk-17.0.12_macos-x64_bin.dmg">https://download.oracle.com/java/17/archive/jdk-17.0.12_macos-x64_bin.dmg</a> (sha256 )
Windows x64 Compressed Archive	172.87 MB	<a href="https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.zip">https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.zip</a> (sha256 )
Windows x64 Installer	153.92 MB	<a href="https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.exe">https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.exe</a> (sha256 )
Windows x64 MSI Installer	152.67 MB	<a href="https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.msi">https://download.oracle.com/java/17/archive/jdk-17.0.12_windows-x64_bin.msi</a> (sha256 )

- b. Miramos que versiones tenemos instaladas de java

```
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> dir "C:\Program Files\Java"

Directorio: C:\Program Files\Java

Mode                LastWriteTime         Length Name
----                -
d-----         6/02/2025   2:00 p. m.         jdk-17
d-----         3/03/2024   4:24 p. m.         jdk-21
```

- c. Cambiamos la versión de java de la 21 a la 17

```
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> $env:JAVA_HOME="C:\Program Files\Java\jdk-17"
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> $env:PATH="$env:JAVA_HOME\bin;$env:PATH"
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> java -version
java version "17.0.12" 2024-07-16 LTS
Java(TM) SE Runtime Environment (build 17.0.12+8-LTS-286)
Java HotSpot(TM) 64-Bit Server VM (build 17.0.12+8-LTS-286, mixed mode, sharing)
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> |
```

4. Compile el proyecto para validar que todo este bien
  - a. Compilamos con mvn package

```
4.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-io/3.4.2/plexus-io-3.4.2.jar
9 kB at 1.2 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/commons-codec/commons-codec/1.16.1/commons-codec-1.16.1
ar
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-archiver/4.9.2/plexus-archiver-
4.9.2.jar (225 kB at 1.9 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/iq80/snappy/snappy/0.4/snappy-0.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/commons-io/commons-io/2.16.1/commons-io-2.16.1.jar (509
at 4.0 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/com/github/luben/zstd-jni/1.5.5-11/zstd-jni-1.5.5-11.ja
Downloaded from central: https://repo.maven.apache.org/maven2/org/iq80/snappy/snappy/0.4/snappy-0.4.jar (58 kB at 329
/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/commons/commons-lang3/3.14.0/commons-lang3-3.
.0.jar (658 kB at 2.6 MB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/commons-codec/commons-codec/1.16.1/commons-codec-1.16.1.
r (365 kB at 1.3 MB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/commons/commons-compress/1.26.1/commons-compr
s-1.26.1.jar (1.1 MB at 2.8 MB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/com/github/luben/zstd-jni/1.5.5-11/zstd-jni-1.5.5-11.jar
6.8 MB at 7.4 MB/s)
[INFO] Building jar: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\maven-archetype-quickstart-1.0-SNA
HOT.jar
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 7.386 s
[INFO] Finished at: 2025-02-06T14:07:43-05:00
[INFO] -----
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library> |
```

5. AGREGAR ESQUELETO DEL PROYECTO
  - a. Cree los siguientes paquetes dentro de edu.eci.cvds.tdd

```

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd> mkdir book

Directorio: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd

Mode                LastWriteTime         Length Name
----                -
d-----          6/02/2025  2:09 p. m.             book

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd> mkdir loan

Directorio: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd

Mode                LastWriteTime         Length Name
----                -
d-----          6/02/2025  2:10 p. m.             loan

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd> mkdir user

Directorio: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library> tree
Listado de rutas de carpetas para el volumen Acer
El número de serie del volumen es C8DF-2DA4
C:.
|_ src
|   |_ main
|       |_ java
|           |_ edu
|               |_ eci
|                   |_ cvds
|                       |_ tdd
|                           |_ library
|                               |_ book
|                               |_ loan
|                               |_ user

```

## 6. AGREGAR CLASES

- a. En el paquete edu.eci.cvds.tdd.library.book cree la siguiente clase:
  - i. Creamos la clase Book

```

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library> cd "C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\book"
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\book> notepad
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\book> notepad
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\book> |

```

- ii. Agregamos el código

```
① README.md pom.xml Bookjava x
C: > Users > Esteban Aguilera > Documents > Lab-03-CVDS > Library > src > main > java > edu > eci > cvds > tdd > library > book > J Bookjava > Book > Book(String, S
1 package main.java.edu.eci.cvds.tdd.library.book;
2
3 public class Book {
4     private final String tittle;
5     private final String author;
6     private final String isbn;
7
8     public Book(String tittle, String author, String isbn) {
9         this.tittle = tittle;
10        this.author = author;
11        this.isbn = isbn;
12    }
13
14    public String getTitle() {
15        return tittle;
16    }
17
18    public String getAuthor() {
19        return author;
20    }
21
22    public String getIsbn() {
23        return isbn;
24    }
25
26    @Override
27    public boolean equals(Object obj) {
28        return isbn.equals(((Book)obj).isbn);
29    }
30 }
```

b. A continuación en el paquete edu.eci.cvds.tdd.library.user cree la siguiente clase:

i. Creamos la clase User

```
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\book> cd ..
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library> cd user
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\user> notepad
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\user> |
```

ii. Agregamos el código

```
① README.md x pom.xml Bookjava User.java x
C: > Users > Esteban Aguilera > Documents > Lab-03-CVDS > Library > src > main > java > edu > eci > cvds > tdd > library > user > J User.java > User > g
1 package main.java.edu.eci.cvds.tdd.library.user;
2
3 public class User {
4     private String name;
5     private String id;
6
7     public String getName() {
8         return name;
9     }
10
11    public void setName(String name) {
12        this.name = name;
13    }
14
15    public String getId() {
16        return id;
17    }
18
19    public void setId(String id) {
20        this.id = id;
21    }
22 }
```

c. En el paquete edu.eci.cvds.tdd.library.loan se deben crear las clases Loan y el enum LoanStatus:

i. Creamos las clases Loan y LoanStatus

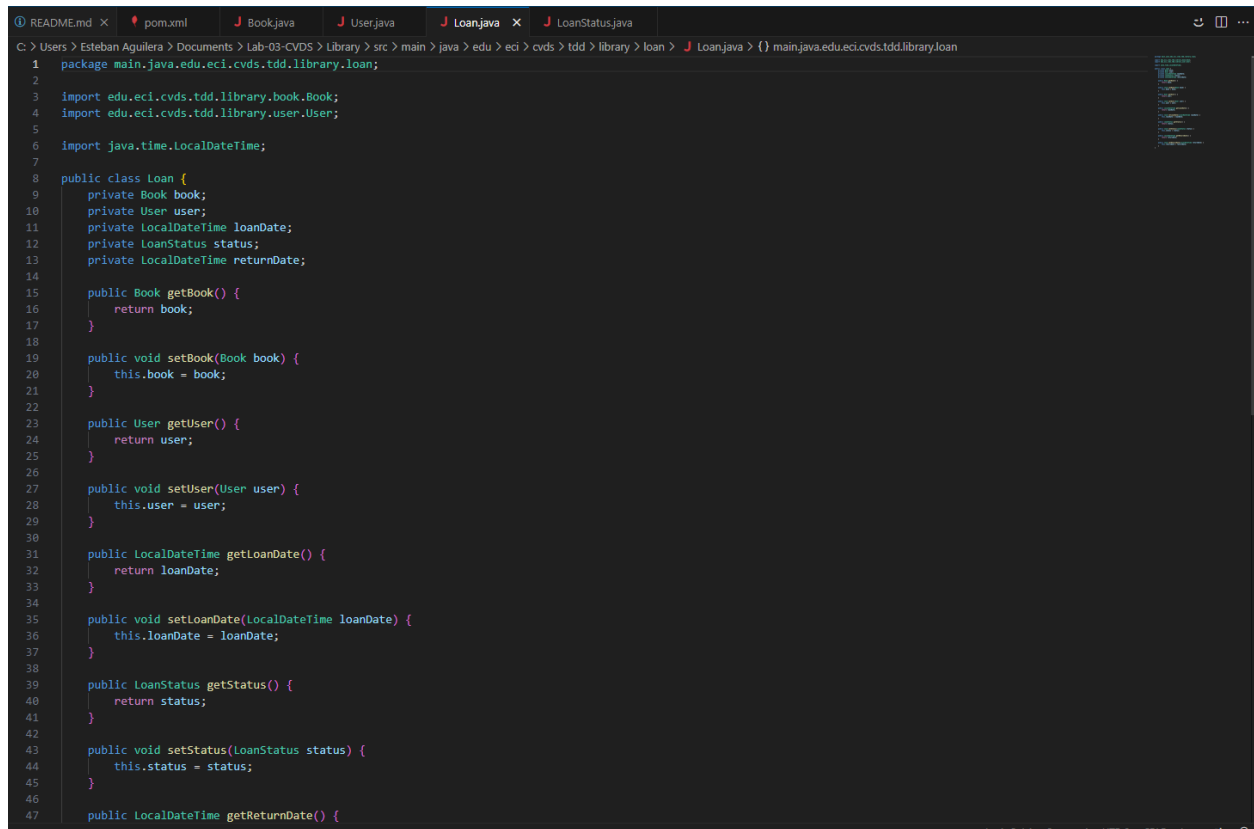
```

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library> cd loan
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\loan> notepad Loan.java
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\loan> cd notepad LoanStatus
Set-Location : No se encuentra ningún parámetro de posición que acepte el argumento 'LoanStatus'.
En línea: 1 Carácter: 1
+ cd notepad LoanStatus
+ ~~~~~
+ CategoryInfo          : InvalidArgument: (:) [Set-Location], ParameterBindingException
+ FullyQualifiedErrorId : PositionalParameterNotFound,Microsoft.PowerShell.Commands.SetLocationCommand

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\loan> notepad LoanStatus.java
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\loan> |

```

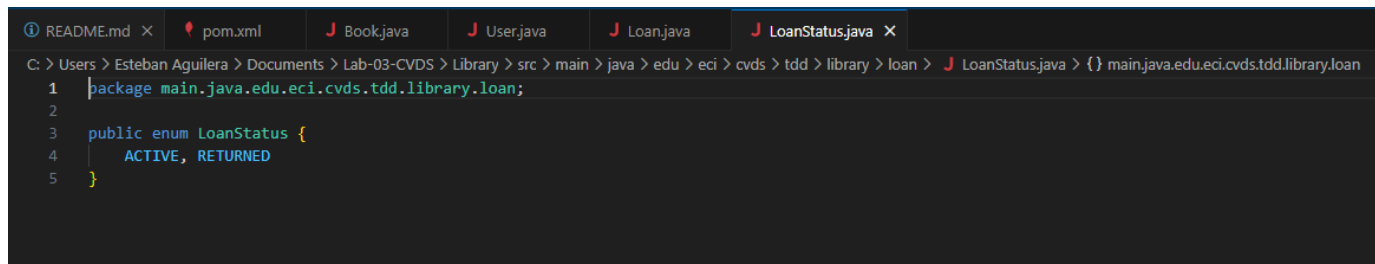
## ii. Agregamos el código de las dos clases



```

1 package main.java.edu.eci.cvds.tdd.library.loan;
2
3 import edu.eci.cvds.tdd.library.book.Book;
4 import edu.eci.cvds.tdd.library.user.User;
5
6 import java.time.LocalDateTime;
7
8 public class Loan {
9     private Book book;
10    private User user;
11    private LocalDateTime loanDate;
12    private LoanStatus status;
13    private LocalDateTime returnDate;
14
15    public Book getBook() {
16        return book;
17    }
18
19    public void setBook(Book book) {
20        this.book = book;
21    }
22
23    public User getUser() {
24        return user;
25    }
26
27    public void setUser(User user) {
28        this.user = user;
29    }
30
31    public LocalDateTime getLoanDate() {
32        return loanDate;
33    }
34
35    public void setLoanDate(LocalDateTime loanDate) {
36        this.loanDate = loanDate;
37    }
38
39    public LoanStatus getStatus() {
40        return status;
41    }
42
43    public void setStatus(LoanStatus status) {
44        this.status = status;
45    }
46
47    public LocalDateTime getReturnDate() {

```



```

1 package main.java.edu.eci.cvds.tdd.library.loan;
2
3 public enum LoanStatus {
4     ACTIVE, RETURNED
5 }

```

- d. por último se debe crear la siguiente clase en el paquete edu.eci.cvds.tdd.library

### i. Creamos la clase library

```

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library\loan> cd ..
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library> notepad Library.java
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\java\edu\eci\cvds\tdd\library>

```

## ii. Agregamos el código

```
① README.md pom.xml Book.java User.java Loan.java LoanStatus.java Library.java X
C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library> src> main> java> edu> eci> cvds> tdd> library> Library
1 package main.java.edu.eci.cvds.tdd.library;
2
3 import edu.eci.cvds.tdd.library.book.Book;
4 import edu.eci.cvds.tdd.library.loan.Loan;
5 import edu.eci.cvds.tdd.library.user.User;
6
7 import java.util.ArrayList;
8 import java.util.HashMap;
9 import java.util.List;
10 import java.util.Map;
11
12 /**
13  * Library responsible for manage the loans and the users.
14  */
15 public class Library {
16
17     private final List<User> users;
18     private final Map<Book, Integer> books;
19     private final List<Loan> loans;
20
21     public Library() {
22         users = new ArrayList<>();
23         books = new HashMap<>();
24         loans = new ArrayList<>();
25     }
26
27     /**
28      * Adds a new {@link edu.eci.cvds.tdd.library.book.Book} into the system, the book is store in a Map that contains
29      * the {@link edu.eci.cvds.tdd.library.book.Book} and the amount of books available, if the book already exist the
30      * amount should increase by 1 and if the book is new the amount should be 1, this method returns true if the
31      * operation is successful false otherwise.
32      *
33      * @param book The book to store in the map.
34      *
35      * @return true if the book was stored false otherwise.
36      */
37     public boolean addBook(Book book) {
38         //TODO Implement the logic to add a new book into the map.
39         return false;
40     }
41
42     /**
43      * This method creates a new loan with for the User identify by the userId and the book identify by the isbn,
44      * the loan should be store in the list of loans, to successfully create a loan is required to validate that the
45      * book is available, that the user exist and the same user could not have a loan for the same book
46      * {@link edu.eci.cvds.tdd.library.loan.LoanStatus#ACTIVE}, once these requirements are meet the amount of books is
47      * decreased and the loan should be created with {@link edu.eci.cvds.tdd.library.loan.LoanStatus#ACTIVE} status and
```

- e. Para validar que la estructura del proyecto está bien se debe compilar usando el comando package.

### i. Compilamos el proyecto con mvn-package

```
[INFO] Compiling 1 source file with javac [debug target 1.8] to target\test-classes
[WARNING] bootstrap class path not set in conjunction with -source 8
[WARNING] source value 8 is obsolete and will be removed in a future release
[WARNING] target value 8 is obsolete and will be removed in a future release
[WARNING] To suppress warnings about obsolete options, use -Xlint:-options.
[INFO]
[INFO] --- surefire:3.2.5:test (default-test) @ maven-archetype-quickstart ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit.JUnit3Provider
[INFO]
[INFO] -----
[INFO] T E S T S
[INFO] -----
[INFO] Running edu.eci.cvds.tdd.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.023 s -- in edu.eci.cvds.tdd.AppTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ maven-archetype-quickstart ---
[INFO] Building jar: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\maven-archetype-quickstart-1.0-SNAPSHOT.jar
[INFO]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO]
[INFO] -----
[INFO] Total time: 2.772 s
[INFO] Finished at: 2025-02-06T14:38:43-05:00
[INFO] -----
```

## 7. PRUEBAS UNITARIAS Y TDD

### a. Creamos la clase de pruebas en la carpeta de test

```
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\test\java\edu\eci\cvds\tdd> mkdir Library

Directorio: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\test\java\edu\eci\cvds\tdd

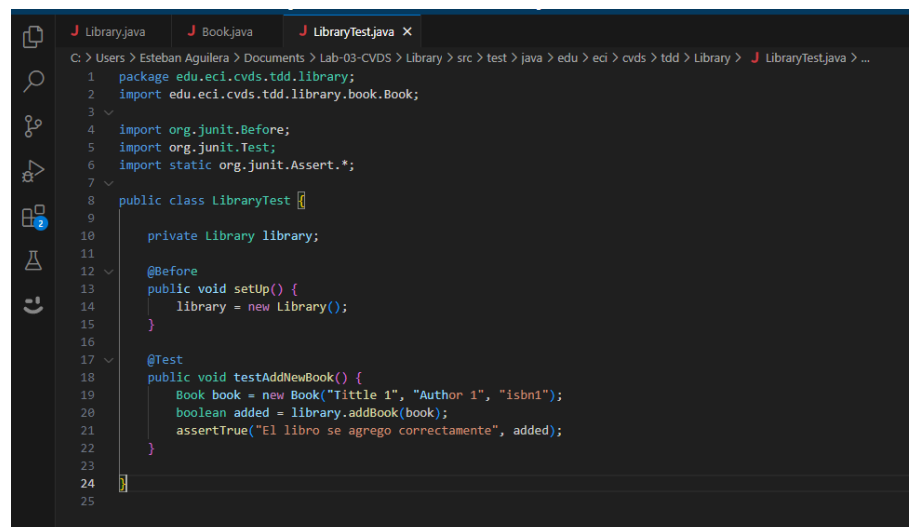
Mode                LastWriteTime         Length Name
----                -
d-----          10/02/2025   7:29 p. m.         Library

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\test\java\edu\eci\cvds\tdd> cd Library
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\test\java\edu\eci\cvds\tdd\Library> notepad LibraryTest.java
```

### b. TEST ADDBOOK

#### i. Pruebas

##### 1. Añadir un nuevo libro



```
1 package edu.eci.cvds.tdd.library;
2 import edu.eci.cvds.tdd.library.book.Book;
3
4 import org.junit.Before;
5 import org.junit.Test;
6 import static org.junit.Assert.*;
7
8 public class LibraryTest {
9
10     private Library library;
11
12     @Before
13     public void setUp() {
14         library = new Library();
15     }
16
17     @Test
18     public void testAddNewBook() {
19         Book book = new Book("Tittle 1", "Author 1", "isbn1");
20         boolean added = library.addBook(book);
21         assertTrue("El libro se agrego correctamente", added);
22     }
23
24
25 }
```

```
[INFO]
[INFO] Results:
[INFO]
[ERROR] Failures:
[ERROR]   LibraryTest.testAddNewBook:21 El libro se agrego correctamente
[INFO]
[ERROR] Tests run: 2, Failures: 1, Errors: 0, Skipped: 0
[INFO]
[INFO] BUILD FAILURE
[INFO]
[INFO] Total time: 2.106 s
[INFO] Finished at: 2025-02-10T20:02:16-05:00
[INFO]
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:3.2.5:test (default-test) on project maven-archetype-quickstart: There are test failures.
[ERROR] Please refer to C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\surefire-reports for the individual test results.
[ERROR] Please refer to dump files (if any exist) [date].dump, [date]-jvmRun[N].dump and [date].dumpstream.
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library> |
```

##### 2. Añadir un libro null



```
LibraryTest.java
C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library\src\test\java> edu> eci> cvds> tdd> library> LibraryTest.java > ...
1 package edu.eci.cvds.tdd.library;
2 import edu.eci.cvds.tdd.library.book.Book;
3
4 import org.junit.Before;
5 import org.junit.Test;
6 import static org.junit.Assert.*;
7
8 public class LibraryTest {
9
10     private Library library;
11
12     @Before
13     public void setUp() {
14         library = new Library();
15     }
16
17     @Test
18     public void testAddNewBook() {
19         Book book = new Book("Tittle 1", "Author 1", "isbn1");
20         boolean added = library.addBook(book);
21         assertTrue("El libro se agrego correctamente", added);
22     }
23
24     @Test(expected = IllegalArgumentException.class)
25     public void testAddBookShouldThrowExceptionWhenNull() {
26         library.addBook(null);
27     }
28 }
29
```

```
[INFO]
[INFO] Results:
[INFO]
[ERROR] Failures:
[ERROR]   LibraryTest.testAddBookShouldThrowExceptionWhenNull Expected exception: java.lang.IllegalArgumentException
[ERROR]   LibraryTest.testAddNewBook:21 El libro se agrego correctamente
[INFO]
[ERROR] Tests run: 3, Failures: 2, Errors: 0, Skipped: 0
[INFO]
[INFO] -----
[INFO] BUILD FAILURE
[INFO] -----
[INFO] Total time: 2.162 s
[INFO] Finished at: 2025-02-10T20:28:42-05:00
[INFO] -----
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:3.2.5:test (default-test) on project maven-archetype-quickstart: There are test failures.
[ERROR] Please refer to C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library\target\surefire-reports for the individual test results.
[ERROR] Please refer to dump files (if any exist) [date].dump, [date]-jvmRun[N].dump and [date].dumpstream.
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library>
```

## ii. Implementación

```

/**
 * Adds a new {@link edu.eci.cvds.tdd.library.book.Book} into the system, the book is store in a Map that contains
 * the {@link edu.eci.cvds.tdd.library.book.Book} and the amount of books available, if the book already exist the
 * amount should increase by 1 and if the book is new the amount should be 1, this method returns true if the
 * operation is successful false otherwise.
 *
 * @param book The book to store in the map.
 *
 * @return true if the book was stored false otherwise.
 */
public boolean addBook(Book book) throws IllegalArgumentException {
    if (book == null) {
        throw new IllegalArgumentException("El libro no puede ser nulo");
    }

    if (books.containsKey(book)){
        books.put(book, books.get(book) + 1);
    }else {
        books.put(book, 1);
    }
    return true;
}

```

### iii. Pruebas finales

```

C:\Windows\System32\cmd.e X + v
[INFO] Compiling 2 source files with javac [debug target 1.8] to target\test-classes
[WARNING] bootstrap class path not set in conjunction with -source 8
[INFO] --- surefire:3.2.5:test (default-test) @ maven-archetype-quickstart ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit4.JUnit4Provider
[INFO]
[INFO] -----
[INFO] T E S T S
[INFO] -----
[INFO] Running edu.eci.cvds.tdd.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.060 s -- in edu.eci.cvds.tdd.AppTest
[INFO] Running edu.eci.cvds.tdd.library.LibraryTest
[INFO] Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.039 s -- in edu.eci.cvds.tdd.library.LibraryTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ maven-archetype-quickstart ---
[INFO] Building jar: C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library\target\maven-archetype-quickstart-1.0-SNAPSHOT.jar
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 5.129 s
[INFO] Finished at: 2025-02-10T20:57:34-05:00
[INFO]
C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library>

```

## c. TEST LOANBOOK

### i. Pruebas

#### 1. Prestamo exitoso

```

@Test
public void testLoanBookCorrectly() {
    Book book = new Book(tittle:"Tittle 1", author:"Author 1", isbn:"isbn1");
    library.addBook(book);
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);
    Loan loan = library.loanABook(userId:"id1", isbn:"isbn1");
    assertNotNull(message:"El préstamo se realizo porque esta el libro", loan);
}

```

## 2. Prestamo con libro no existente

```
@Test(expected = IllegalArgumentException.class)
public void testLoanBookFailIfBookNotExists() {
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);

    Loan loan = library.loanABook(userId:"nonExistentUser", isbn:"isbn1");
    assertNull(message:"El préstamo es nulo porque no hay libros", loan);
}
```

## 3. Prestamo con usuario no existente

```
@Test(expected = IllegalArgumentException.class)
public void testLoanBookFailIfUserNotExists() {
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);

    Loan loan = library.loanABook(userId:"nonExistentUser", isbn:"isbn1");
    assertNull(message:"El préstamo es nulo porque no hay libros", loan);
}
```

## 4. Prestamo con préstamo ya realizado

```
@Test
public void testLoanBookButWasLoan() {
    Book book = new Book(title:"Tittle 1", author:"Author 1", isbn:"isbn1");
    library.addBook(book);
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);
    Loan loan = library.loanABook(userId:"id1", isbn:"isbn1");
    Loan loan2 = library.loanABook(userId:"id1", isbn:"isbn1");
    assertNull(message:"El préstamo no se realizo porque no hay libro", loan2);
}
```

## 5. Prestamo pero no hay cantidad de libros suficientes.

```
@Test(expected = IllegalArgumentException.class)
public void testLoanBookNoAmount() {
    Book book = new Book(title:"Tittle 1", author:"Author 1", isbn:"isbn1");
    library.addBook(book);
    User user = new User(name:"user1",id:"id1");
    User user2 = new User(name:"user2",id:"id2");
    library.addUser(user);
    library.addUser(user2);
    Loan loan = library.loanABook(userId:"id1", isbn:"isbn1");
    Loan loan2 = library.loanABook(userId:"id2", isbn:"isbn1");
    assertNull(message:"El préstamo no se realizo porque no hay libro", loan2);
}
```

## ii. Compilación fallida

```
C:\Windows\System32\cmd.exe X + v
[INFO] Results:
[INFO]
[ERROR] Failures:
[ERROR]   LibraryTest.testLoanBookCorrectly:41 El préstamo se realizo porque esta el libro
[ERROR]   LibraryTest.testLoanBookFailIfBookNotExists Expected exception: java.lang.IllegalArgumentException
[ERROR]   LibraryTest.testLoanBookFailIfUserNotExists Expected exception: java.lang.IllegalArgumentException
[ERROR]   LibraryTest.testLoanBookNoAmount Expected exception: java.lang.IllegalArgumentException
[INFO]
[ERROR] Tests run: 8, Failures: 4, Errors: 0, Skipped: 0
[INFO]
[INFO] -----
[INFO] BUILD FAILURE
[INFO] -----
[INFO] Total time: 2.705 s
[INFO] Finished at: 2025-02-11T19:48:57-05:00
[INFO] -----
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:3.2.5:test (default-test) on proje
ct maven-archetype-quickstart: There are test failures.
[ERROR]
[ERROR] Please refer to C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\surefire-reports for the
individual test results.
[ERROR] Please refer to dump files (if any exist) [date].dump, [date]-jvmRun[N].dump and [date].dumpstream.
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library>
```

### iii. Implementación

```

public Loan loanABook(String userId, String isbn) {

    Book book = searchBookByIsbn(isbn);

    if (book==null){
        throw new IllegalArgumentException("El libro con ISBN " + isbn + " no existe.");
    }
    if (books.containsKey(book) && verifyUser(userId) && verifyLoans(userId,book) ){

        if (books.get(book) > 0){
            User user = searchUserById(userId);
            Loan loan = new Loan(book,user);
            loans.add(loan);
            books.put(book, books.get(book) - 1);
            return loan;
        }else {
            throw new IllegalArgumentException("No hay libros disponibles para prestar.");
        }
    }
    return null;
}

public User searchUserById(String userId){
    for (User u : users){
        if (u.getId().equals(userId)){
            return u;
        }
    }
    return null;
}

public Book searchBookByIsbn(String isbn) {
    for (Book book : books.keySet()) {
        if (book.getIsbn().equals(isbn)) {
            return book;
        }
    }
    return null;
}

public boolean verifyUser(String userId) {
    for (User u : users) {
        if (u.getId().equals(userId)) {
            return true;
        }
    }
    return false;
}

public boolean verifyLoans(String userId, Book book){
    for (Loan l: loans){
        if (l.getUser().getId().equals(userId) && l.getBook().equals(book) && l.getStatus() == LoanStatus.ACTIVE){
            return false;
        }
    }
    return true;
}
}

```

#### iv. Pruebas Finales

```

C:\Windows\System32\cmd.exe
[INFO] --- compiler:3.13.0:testCompile (default-testCompile) @ maven-archetype-quickstart ---
[INFO] Nothing to compile - all classes are up to date.
[INFO] --- surefire:3.2.5:test (default-test) @ maven-archetype-quickstart ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit4.JUnit4Provider
[INFO]
[INFO] T E S T S
[INFO]
[INFO] Running edu.eci.cvds.tdd.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.047 s -- in edu.eci.cvds.tdd.AppTest
[INFO] Running edu.eci.cvds.tdd.library.LibraryTest
[INFO] Tests run: 7, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.034 s -- in edu.eci.cvds.tdd.library.LibraryTest
[INFO] Results:
[INFO] Tests run: 8, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ maven-archetype-quickstart ---
[INFO] Building jar: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\maven-archetype-quickstart-1.0-SNAPSHOT.jar
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 2.566 s
[INFO] Finished at: 2025-02-11T19:39:49-05:00
[INFO]
C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library>

```

#### d. Test returnLoan

##### i. Pruebas

### 1. Retorno de préstamo válido

```
@Test
public void testReturnLoanValid(){
    Book book = new Book(tittle:"Tittle 1", author:"Author 1", isbn:"isbn1");
    library.addBook(book);
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);
    Loan loan = library.loanABook(userId:"id1", isbn:"isbn1");
    assertEquals(library.returnLoan(loan).getStatus(),LoanStatus.RETURNED);
}
```

### 2. Préstamo no esta en el sistema

```
@Test(expected = IllegalArgumentException.class)
public void testReturnLoanNoPresentInLoansOfSystem(){
    Book book = new Book(tittle:"Tittle 1", author:"Author 1", isbn:"isbn1");
    User user = new User(name:"user1",id:"id1");
    Loan loan = new Loan(book,user);
    assertEquals(library.returnLoan(loan).getStatus(),LoanStatus.RETURNED);
}
```

### 3. Préstamo null

```
@Test(expected = IllegalArgumentException.class)
public void testReturnLoanNull(){
    assertEquals(library.returnLoan(loan:null).getStatus(),LoanStatus.RETURNED);
}
```

### 4. Préstamo que ya ha sido retornado

```
@Test(expected = IllegalArgumentException.class)
public void testReturnLoanAlreadyReturned(){
    Book book = new Book(tittle:"Tittle 1", author:"Author 1", isbn:"isbn1");
    library.addBook(book);
    User user = new User(name:"user1",id:"id1");
    library.addUser(user);
    Loan loan = library.loanABook(userId:"id1", isbn:"isbn1");
    library.returnLoan(loan);
    assertEquals(library.returnLoan(loan).getStatus(),LoanStatus.RETURNED);
}
```

### ii. Compilación fallida

```

[ERROR] LibraryTest.testReturnLoanNoPresentInLoansOfSystem » Unexpected exception, expected<java.lang.IllegalArgumentException> but was<java.lang.NullPointerException>
[ERROR] LibraryTest.testReturnLoanNull » Unexpected exception, expected<java.lang.IllegalArgumentException> but was<java.lang.NullPointerException>
[ERROR] LibraryTest.testReturnLoanValid:95 NullPointer Cannot invoke "edu.eci.cvds.tdd.library.loan.Loan.getStatus()" because the return value of "edu.eci.cvds.tdd.library.Library.returnLoan(edu.eci.cvds.tdd.library.loan.Loan)" is null
[INFO] Tests run: 12, Failures: 0, Errors: 4, Skipped: 0
[INFO]
[INFO] BUILD FAILURE
[INFO]
[INFO] Total time: 3.881 s
[INFO] Finished at: 2025-02-11T19:37:42-05:00
[INFO]
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:3.2.5:test (default-test) on project maven-archetype-quickstart:
[ERROR] Please refer to C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library\target\surefire-reports for the individual test results.
[ERROR] Please refer to dump files (if any exist) [date].dump, [date]-jvmRun[N].dump and [date].dumpstream.
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
C:\Users\Juan\Desktop\CVDS\Lab-03-CVDS\Library>

```

### iii. Implementación

```

/**
 * This method return a loan, meaning that the amount of books should be increased by 1, the status of the Loan
 * in the loan list should be {@link edu.eci.cvds.tdd.library.loan.LoanStatus#RETURNED} and the loan return
 * date should be the current date, validate that the loan exist.
 *
 * @param loan loan to return.
 *
 * @return the loan with the RETURNED status.
 */
public Loan returnLoan(Loan loan) {
    if (loan == null || !loans.contains(loan) || loan.getStatus() != LoanStatus.ACTIVE) {
        throw new IllegalArgumentException(s:"El préstamo no es válido o ya fue devuelto.");
    }

    loan.setStatus(LoanStatus.RETURNED);
    loan.setReturnDate(LocalDate.now());
    Book book = loan.getBook();
    if (book != null && books.containsKey(book)) {
        books.put(book, books.get(book) + 1);
    }
    return loan;
}

```

### iv. Pruebas Finales

```
C:\Windows\System32\cmd.e x + v
[INFO] --- compiler:3.13.0:testCompile (default-testCompile) @ maven-archetype-quickstart ---
[INFO] Nothing to compile - all classes are up to date.
[INFO] --- surefire:3.2.5:test (default-test) @ maven-archetype-quickstart ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit4.JUnit4Provider
[INFO]
[INFO] T E S T S
[INFO]
[INFO] Running edu.eci.cvds.tdd.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.047 s -- in edu.eci.cvds.tdd.AppTest
[INFO] Running edu.eci.cvds.tdd.library.LibraryTest
[INFO] Tests run: 11, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.062 s -- in edu.eci.cvds.tdd.library.L
[INFO] libraryTest
[INFO] Results:
[INFO] Tests run: 12, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ maven-archetype-quickstart ---
[INFO] Building jar: C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\target\maven-archetype-quickstart-1
[INFO] .0-SNAPSHOT.jar
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 2.901 s
[INFO] Finished at: 2025-02-11T19:51:12-05:00
[INFO]
C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library>
```

8. Cobertura

- a. Agregamos la dependencia de jacoco, compilamos y miramos el archivo generado

Element	Missed Instructions	Cov	Missed Branches	Cov	Missed	Cxty	Missed	Lines	Missed	Methods	Missed	Classes
edu.eci.cvds.tdd.library	<div></div>	92 %	<div></div>	75 %	11	31	5	52	0	9	0	1
edu.eci.cvds.tdd.library.loan	<div></div>	73 %		n/a	5	12	8	24	5	12	0	2
edu.eci.cvds.tdd.library.user	<div></div>	52 %		n/a	3	5	5	10	3	5	0	1
edu.eci.cvds.tdd	<div></div>	0 %		n/a	2	2	3	3	2	2	1	1
edu.eci.cvds.tdd.library.book	<div></div>	78 %		n/a	2	5	2	9	2	5	0	1
Total	63 of 407	84 %	11 of 44	75 %	23	55	23	98	12	33	1	6

- b. Al revisar los metodos no usamos, notamos que son gets y sets de las clases loan, user y book. Decidimos borrarlos ya que no hacemos uso de estos
- c. Compilamos nuevamente para ver el nuevo %

Element	Missed Instructions	Cov	Missed Branches	Cov	Missed	Cxty	Missed	Lines	Missed	Methods	Missed	Classes
edu.eci.cvds.tdd.library	<div></div>	93 %	<div></div>	75 %	11	31	4	49	0	9	0	1
edu.eci.cvds.tdd.library.loan	<div></div>	87 %		n/a	2	9	3	19	2	9	0	2
edu.eci.cvds.tdd	<div></div>	0 %		n/a	2	2	3	3	2	2	1	1
edu.eci.cvds.tdd.library.book	<div></div>	100 %		n/a	0	3	0	7	0	3	0	1
edu.eci.cvds.tdd.library.user	<div></div>	100 %		n/a	0	2	0	5	0	2	0	1
Total	33 of 378	91 %	11 of 44	75 %	15	47	10	83	4	25	1	6

9. SONARQUBE

- a. Instalamos docker
- b. Arrancamos el servicio



```

PS C:\Users\Esteban Aguilera> docker run -d --name sonarqube -e SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true -p 9000:9000 sonarqube:latest
Unable to find image 'sonarqube:latest' locally
latest: Pulling from library/sonarqube
4f4fb70ef54: Download complete
7926325aa21b: Download complete
f03e4717322c: Download complete
78c140f0a6a2: Download complete
dbe46403441a: Download complete
5a7813e071bf: Download complete
f9f4ee04af87: Download complete
e3da94a33fa1: Download complete
Digest: sha256:244903768102235d863d2d43ba82cd309c231358c8af4a6ae65db6b5f1537fde
Status: Downloaded newer image for sonarqube:latest
b530017bb18293800ffb029db781e2e62f63a5b20eb7cb355b25fffa3bcdad1

```

c. Probamos el funcionamiento

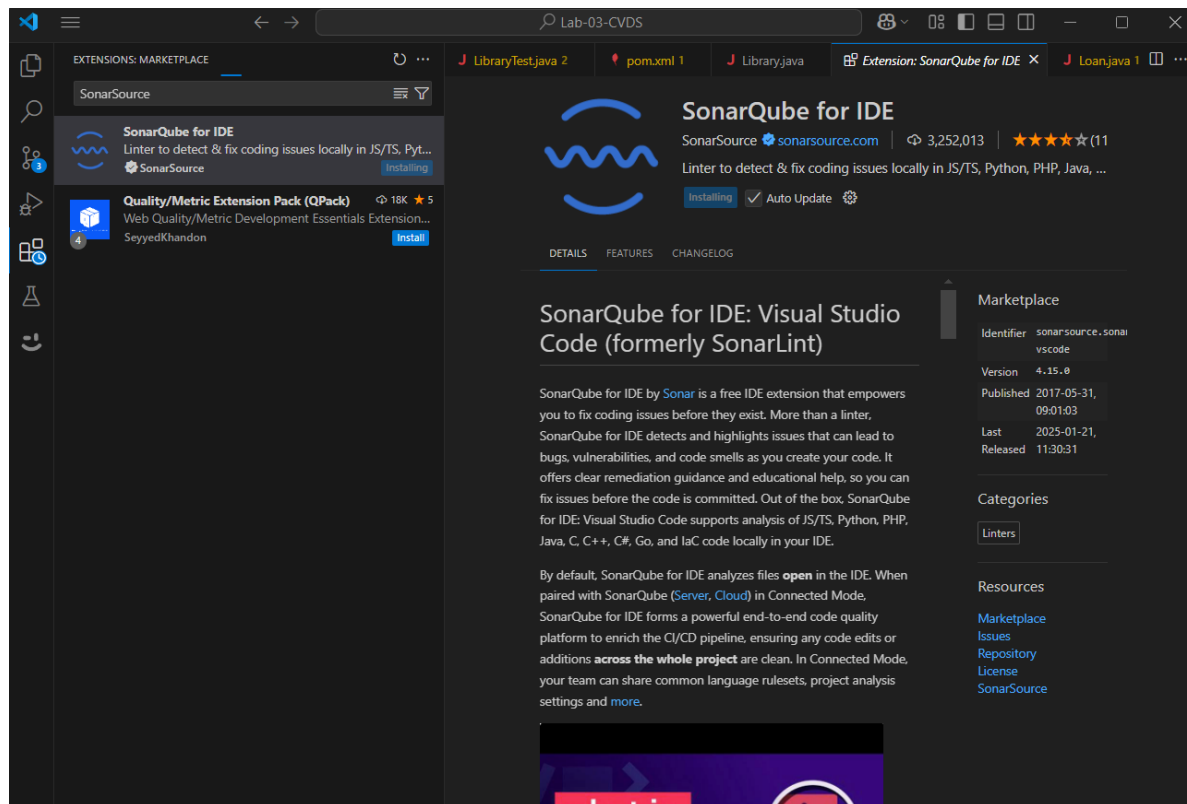
```

PS C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS> docker ps -a

```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
b530017bb182	sonarqube:latest	"/opt/sonarqube/dock..."	About a minute ago	Up About a minute	0.0.0.0:9000->9000/tcp

d. Instalamos la extension de sonar en visual



e. Creamos el token en la pagina

### Security

If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token as a replacement of the user login. This will increase the security of your installation by not letting your analysis user's password going through your network.

#### Generate Tokens

Name  Type  Expires in

✓ New token "token" has been created.  Copy it now, you won't be able to see it again!

sqa\_039511e994dbcf9627689405ef3381835c972fc

Name	Type	Project	Last use	Created	Expiration
token	Global		Never	February 11, 2025	March 12, 2025

#### Enter a new password

All fields marked with \* are required

Old Password \*

Password \*

f. Compilamos el proyecto y miramos la cobertura:

```
C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library>mvn package mvn verify sonar:sonar -D sonar.token=sqa_51823d7c006b8853df4a23ab850f3466ed57eb19

C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library>mvn verify sonar:sonar -D sonar.token=sqa_51823d7c006b8853df4a23ab850f3466ed57eb19
[INFO] Scanning for projects...
[INFO] -----< edu.eci.cvds:maven-archetype-quickstart >-----
[INFO] Building maven-archetype-quickstart 1.0-SNAPSHOT
[INFO] from pom.xml
[INFO] -----[ jar ]-----
[INFO] --- jacoco:0.8.12:prepare-agent (default) @ maven-archetype-quickstart ---
[INFO] argLine set to "-javaagent:C:\\Users\\Esteban Aguilera\\.m2\\repository\\org\\jacoco\\org.jacoco.agent\\0.8.12\\org.jacoco.agent-0.8.12-runtime.jar=destfile=C:\\Users\\Esteban Aguilera\\Documents\\Lab-03-CVDS\\Library\\target\\jacoco.exec"
[INFO] --- resources:3.3.1:resources (default-resources) @ maven-archetype-quickstart ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory C:\Users\Esteban Aguilera\Documents\Lab-03-CVDS\Library\src\main\resources
[INFO] --- compiler:3.13.0:compile (default-compile) @ maven-archetype-quickstart ---
[INFO] Nothing to compile - all classes are up to date.
```

My Favorites

All

Filters

Quality Gate

Passed

1

Failed

0

Security

A

0 info issues

1

B

1 low issue

0

C

1 medium issue

0

D

1 high issue

0

E

1 blocker issue

0

Reliability

A

0 info issues

0

B

1 low issue

0

C

1 medium issue

1

D

1 high issue

0

E

1 blocker issue

0

Maintainability

Ratio of the estimated time needed to fix all outstanding maintainability issues to the size of the project

A

5% to 0%

1

B

5% to <10%

0

C

10% to <20%

0

D

20% to <50%

0

E

50%

0

Security Review

The percentage of reviewed (fixed or safe) security hotspots

A

80%

1

Search for projects...

Perspective

Overall Status

Sort by

Name

1 project(s)

library PUBLIC

Passed

Last analysis: 39 seconds ago - 249 Lines of Code - Java, XML

A

0

Security

C

3

Reliability

A

20

Maintainability

A

—

Hotspots Reviewed

85.0%

Coverage

0.0%

Duplications

1 of 1 shown