JAVA

GRAPHICAL USER INTERFACE

(GUI)

DESKTOP APPLIATION DEVELOPMENT

Manual Book

by

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Northern City

Published in 2024

Course Outline

Week-1

- **Software Installation**
- **Data CRUD Part-1**
- **Data CRUD Part-2**
- **Assignment-1**

Week-2

- Upload Photo
- Pagination & Search
- Date Picker
- Assignment-2

Week-3

- Printing Invoice
- Export Data to Excel
- Export Data to PDF
- Assignment-3

Week-4

- Login and Registration
- Password Hashing
- Window Application Setup Creation
- Mac OS Application Setup Creation
- Assignment-4

Week-5

- Coffee Shop Part-1
- Coffee Shop Part-2
- Coffee Shop Part-3
- Coffee Shop Part-4
- Assignment-5

Week-6

- Cinema Ticketing Part-1
- Cinema Ticketing Part-2
- Cinema Ticketing Part-3
- Cinema Ticketing part-4
- Assignment-6

Week-7

- Student Project Part-1
  Database Design
- Student Project Part-2
  Application UI Design
- Student Project Part-3
  Coding
- Student Project Part-4
  Setup/Publishing

Week-8

- Project Submission
- Certificate Processing

Week-1

- SOFTWARE INSTALLATION
  - Video Lesson-1
- Running the first Application
  - Video Lesson -2
- Data CRUD Part-1
  - Video Lesson-3
- Data CRUD Part-2
  - Video Lesson-4
- Assignment-1

  -category crud and items crud

Software installations

🎬Video Lesson 1

Software Installation

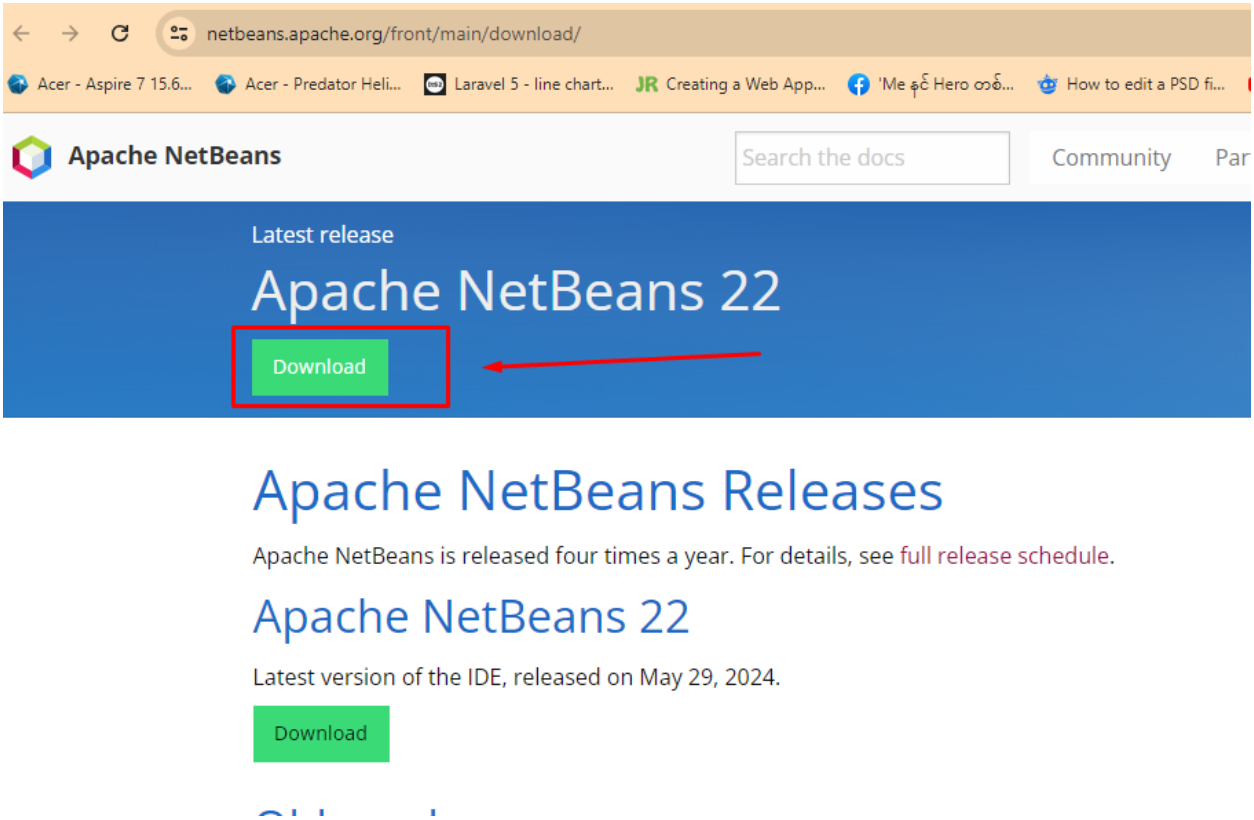
အောက်က link ကို သွားပြီး netbean software ကို download ဆွဲပါ။

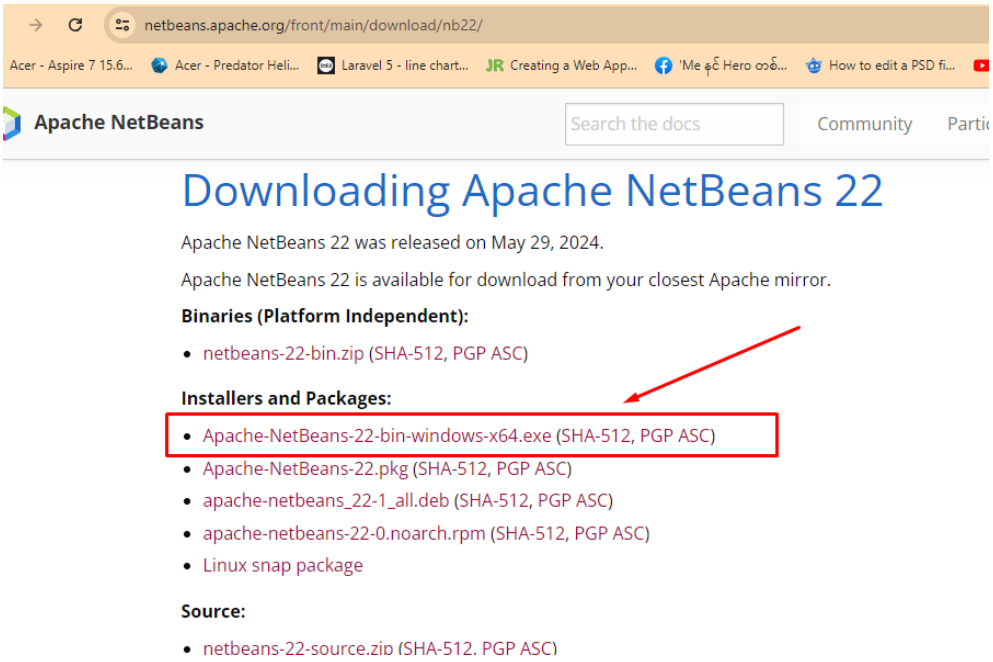
//

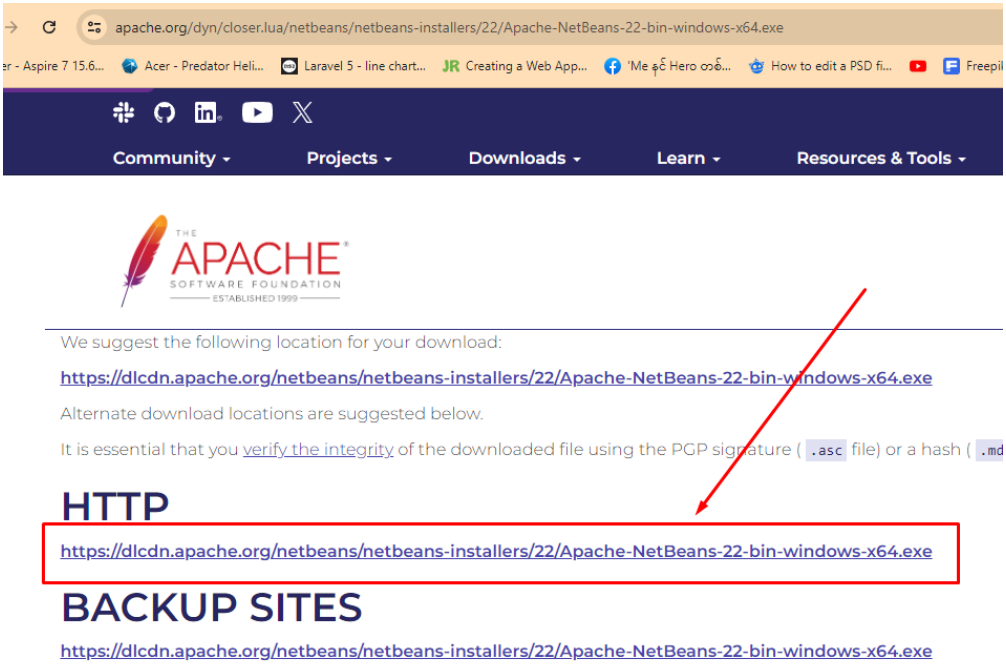
https://netbeans.apache.org/front/main/download/

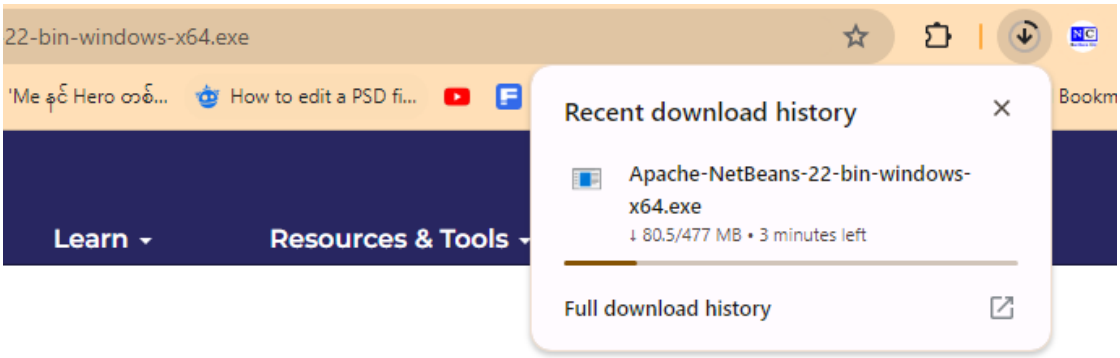
//

Installation process ကို အောက်ပါအတိုင်း အဆင့်ဆင့် ပြုလုပ်ရပါမယ်။



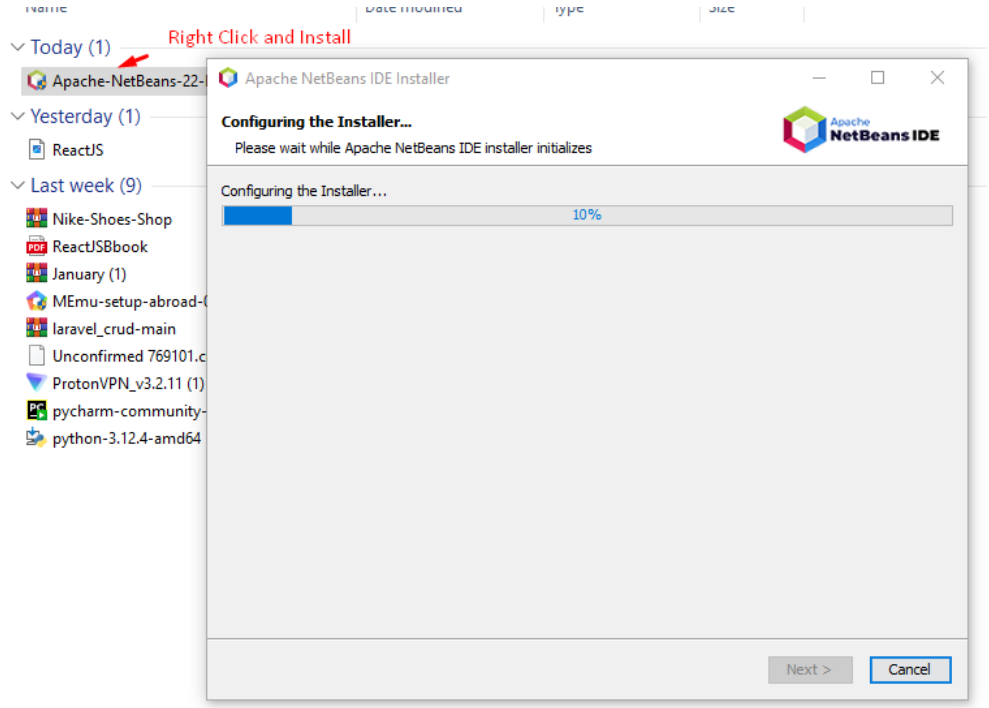

netbeans.apache.org/front/main/download/nb22/
Apache NetBeans
Search the docs
Community
Downloading Apache NetBeans 22
Apache NetBeans 22 was released on May 29, 2024.
Apache NetBeans 22 is available for download from your closest Apache mirror.
Binaries (Platform Independent):
netbeans-22-bin.zip (SHA-512, PGP ASC)
Installers and Packages:
Apache-NetBeans-22-bin-windows-x64.exe (SHA-512, PGP ASC)
Apache-NetBeans-22.pkg (SHA-512, PGP ASC)
apache-netbeans_22-1_all.deb (SHA-512, PGP ASC)
apache-netbeans-22-0.noarch.rpm (SHA-512, PGP ASC)
Linux snap package
Source:
netbeans-22-source.zip (SHA-512, PGP ASC)

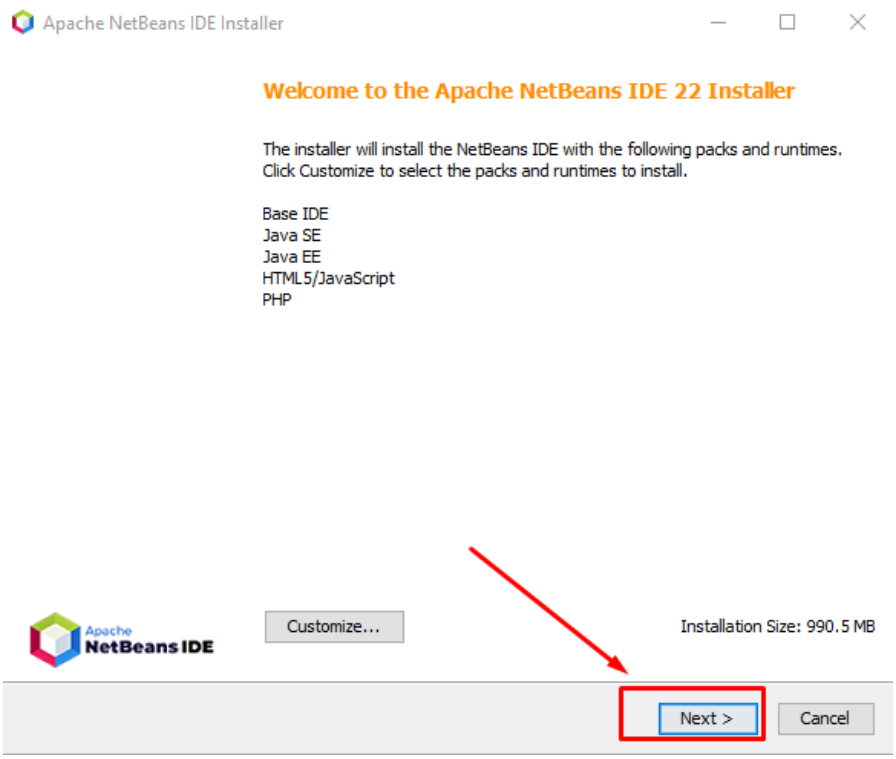

apache.org/dyn/closer.lua/netbeans/netbeans-installers/22/Apache-NetBeans-22-bin-windows-x64.exe
Community
Projects
Downloads
Learn
Resources & Tools
APACHE
SOFTWARE FOUNDATION
We suggest the following location for your download:
https://dlcdn.apache.org/netbeans/netbeans-installers/22/Apache-NetBeans-22-bin-windows-x64.exe
Alternate download locations are suggested below.
HTTP
https://dlcdn.apache.org/netbeans/netbeans-installers/22/Apache-NetBeans-22-bin-windows-x64.exe
BACKUP SITES
https://dlcdn.apache.org/netbeans/netbeans-installers/22/Apache-NetBeans-22-bin-windows-x64.exe

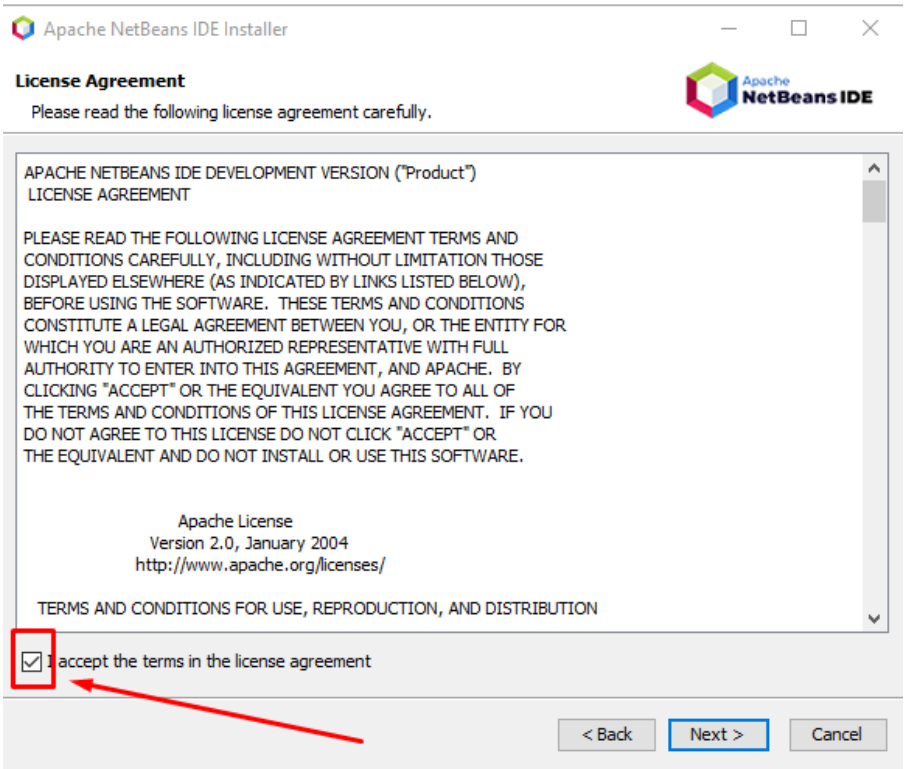


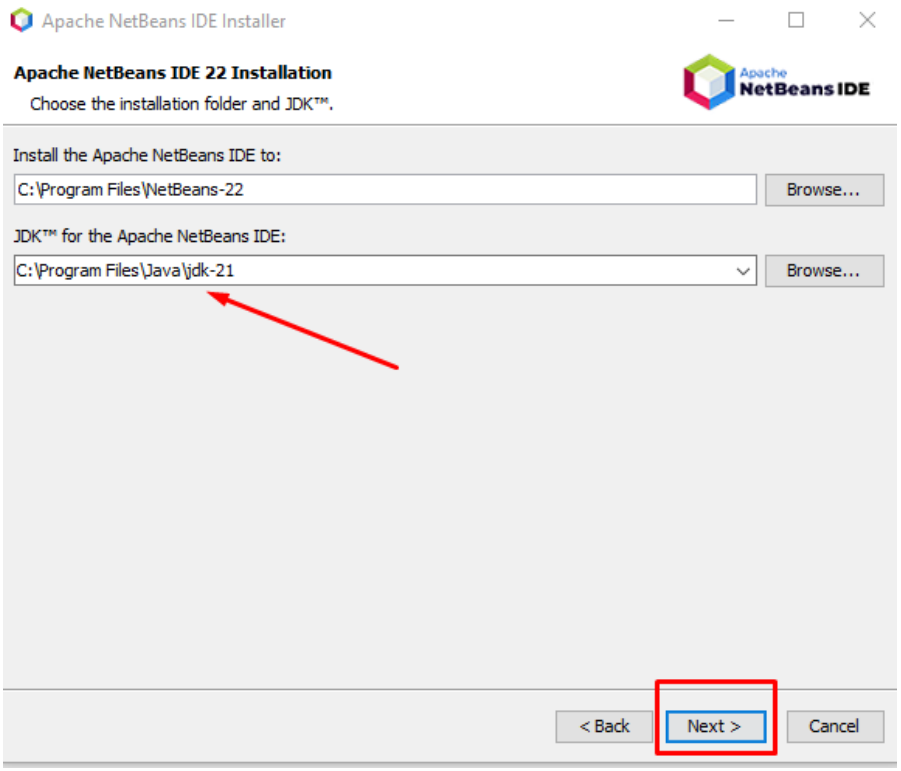
-NetBeans-22-bin-windows-x64.exe

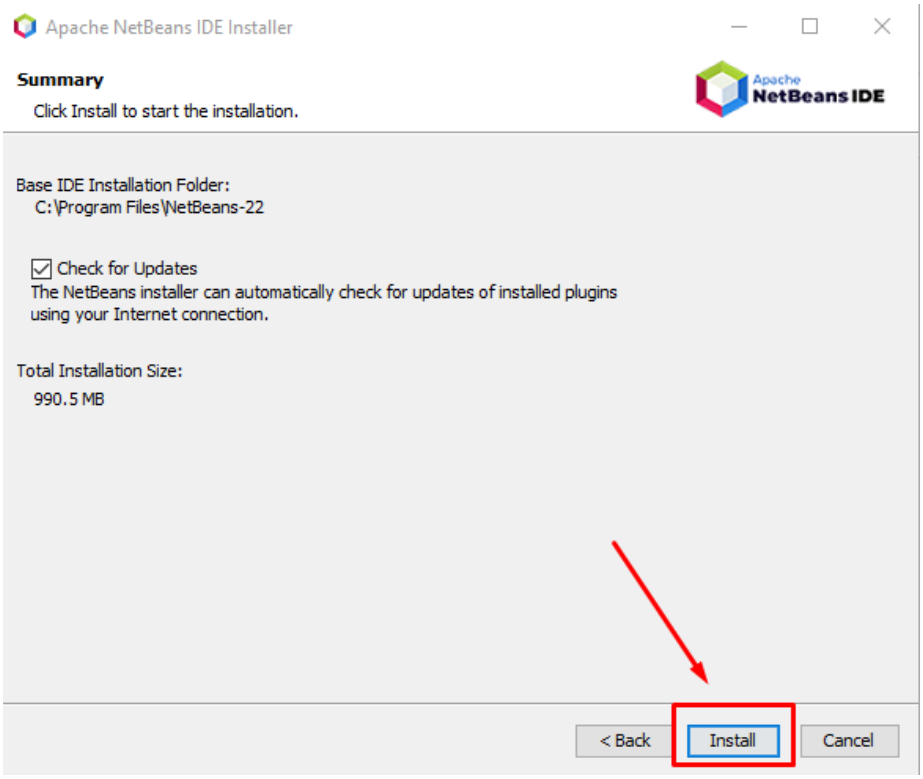
g the PGP signature (`.asc` file) or a hash (`.md5` or `.sha*` file).

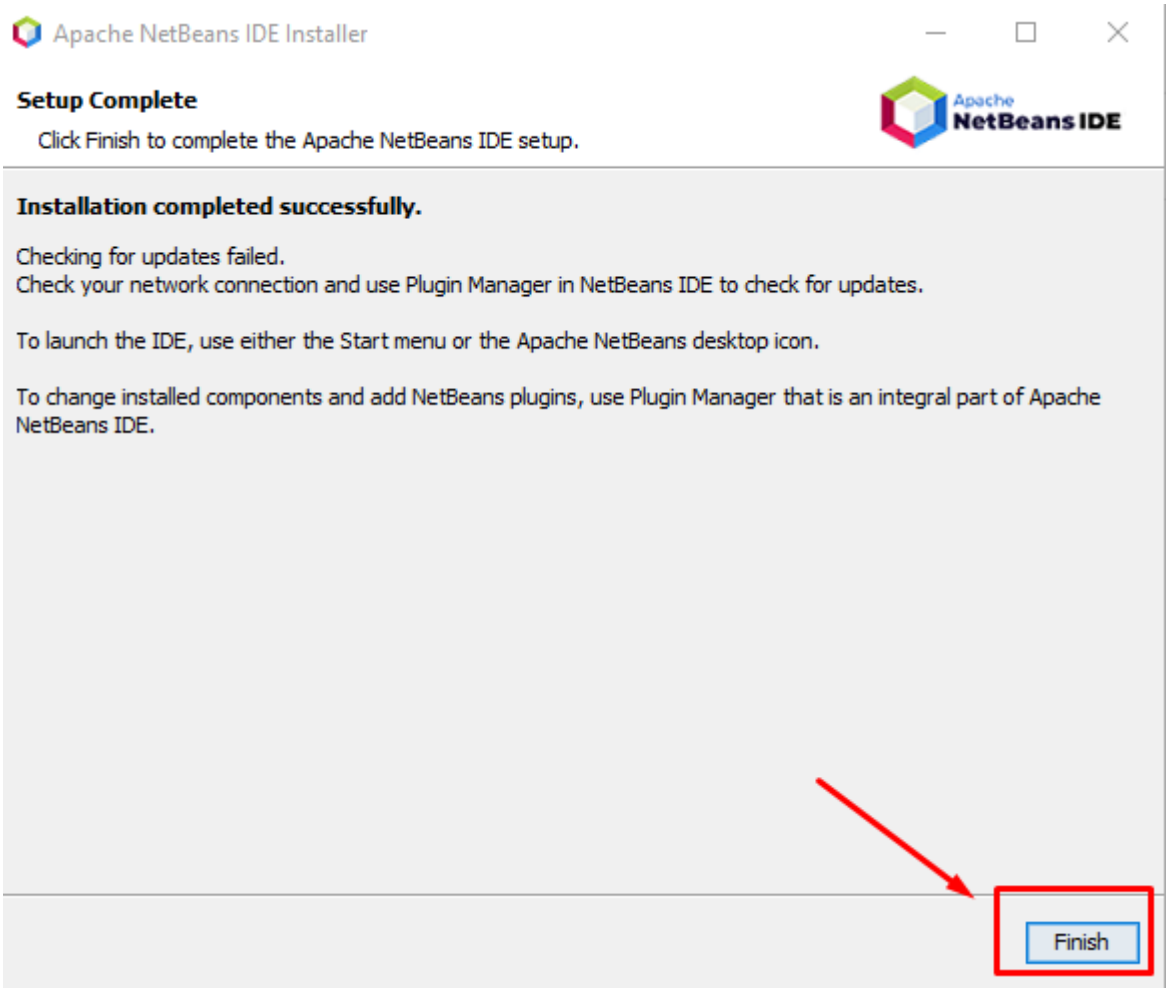



Apache NetBeans IDE Installer
Welcome to the Apache NetBeans IDE 22 Installer
The installer will install the NetBeans IDE with the following packs and runtimes.
Click Customize to select the packs and runtimes to install.
Base IDE
Java SE
Java EE
HTML5/JavaScript
PHP
Apache NetBeans IDE
Customize...
Installation Size: 990.5 MB
Next >
Cancel


Apache NetBeans IDE Installer
License Agreement
Please read the following license agreement carefully.
Apache NetBeans IDE
APACHE NETBEANS IDE DEVELOPMENT VERSION ("Product")
LICENSE AGREEMENT
PLEASE READ THE FOLLOWING LICENSE AGREEMENT TERMS AND
CONDITIONS CAREFULLY, INCLUDING WITHOUT LIMITATION THOSE
DISPLAYED ELSEWHERE (AS INDICATED BY LINKS LISTED BELOW),
BEFORE USING THE SOFTWARE. THESE TERMS AND CONDITIONS
CONSTITUTE A LEGAL AGREEMENT BETWEEN YOU, OR THE ENTITY FOR
WHICH YOU ARE AN AUTHORIZED REPRESENTATIVE WITH FULL
AUTHORITY TO ENTER INTO THIS AGREEMENT, AND APACHE. BY
CLICKING "ACCEPT" OR THE EQUIVALENT YOU AGREE TO ALL OF
THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT. IF YOU
DO NOT AGREE TO THIS LICENSE DO NOT CLICK "ACCEPT" OR
THE EQUIVALENT AND DO NOT INSTALL OR USE THIS SOFTWARE.
Apache License
Version 2.0, January 2004
http://www.apache.org/licenses/
TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION
I accept the terms in the license agreement
< Back
Next >
Cancel


Apache NetBeans IDE Installer
Apache NetBeans IDE 22 Installation
Choose the installation folder and JDK™.
Apache NetBeans IDE
Install the Apache NetBeans IDE to:
C:\Program Files\NetBeans-22
Browse...
JDK™ for the Apache NetBeans IDE:
C:\Program Files\Java\jdk-21
Browse...
< Back
Next >
Cancel

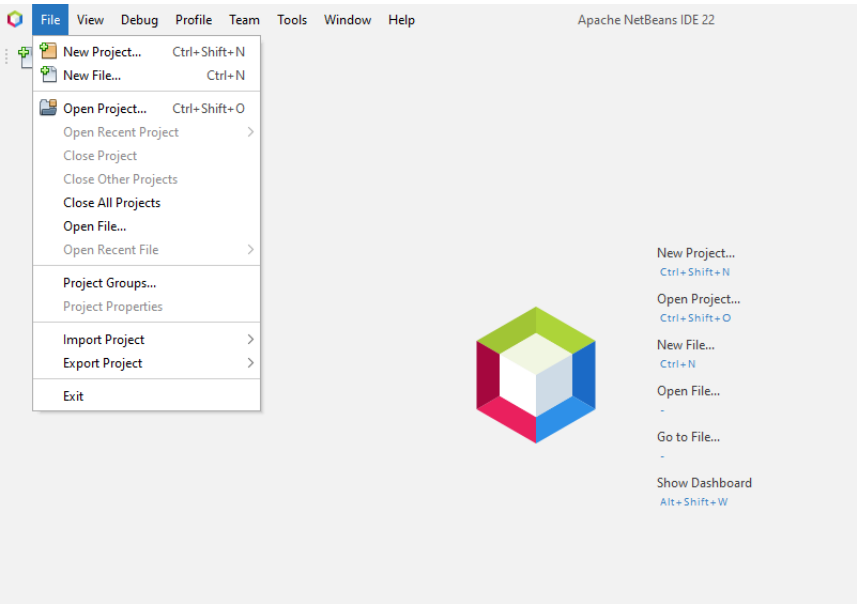

Apache NetBeans IDE Installer
Summary
Click Install to start the installation.
Apache NetBeans IDE
Base IDE Installation Folder:
C:\Program Files\NetBeans-22
Check for Updates
The NetBeans installer can automatically check for updates of installed plugins
using your Internet connection.
Total Installation Size:
990.5 MB
< Back
Install
Cancel

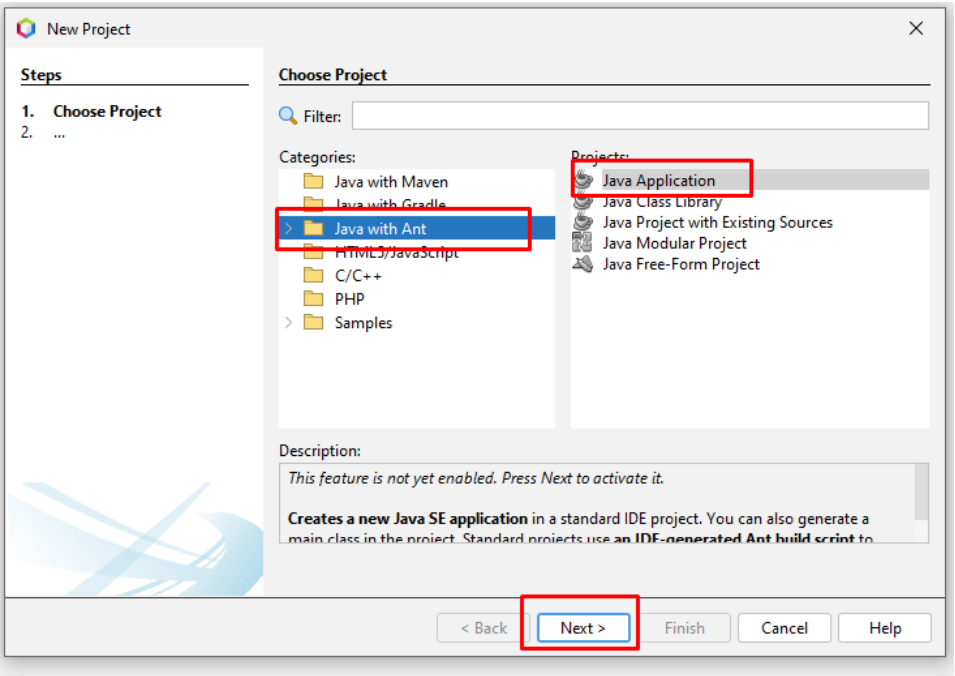

Apache NetBeans IDE Installer
Setup Complete
Click Finish to complete the Apache NetBeans IDE setup.
Apache NetBeans IDE
Installation completed successfully.
Checking for updates failed.
Check your network connection and use Plugin Manager in NetBeans IDE to check for updates.
To launch the IDE, use either the Start menu or the Apache NetBeans desktop icon.
To change installed components and add NetBeans plugins, use Plugin Manager that is an integral part of Apache NetBeans IDE.
Finish

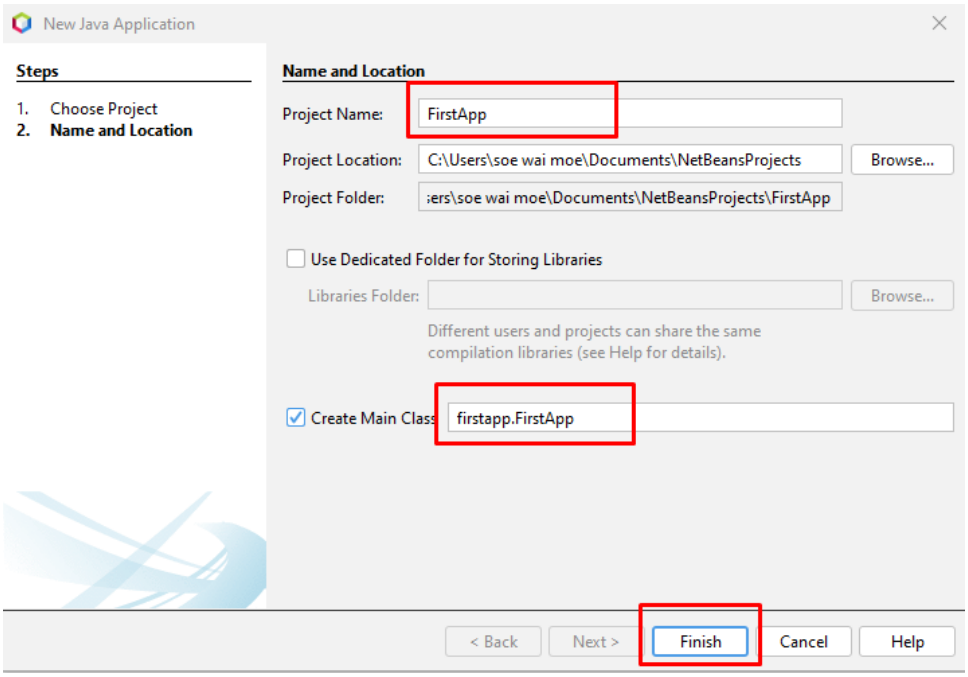
Runing the first Application

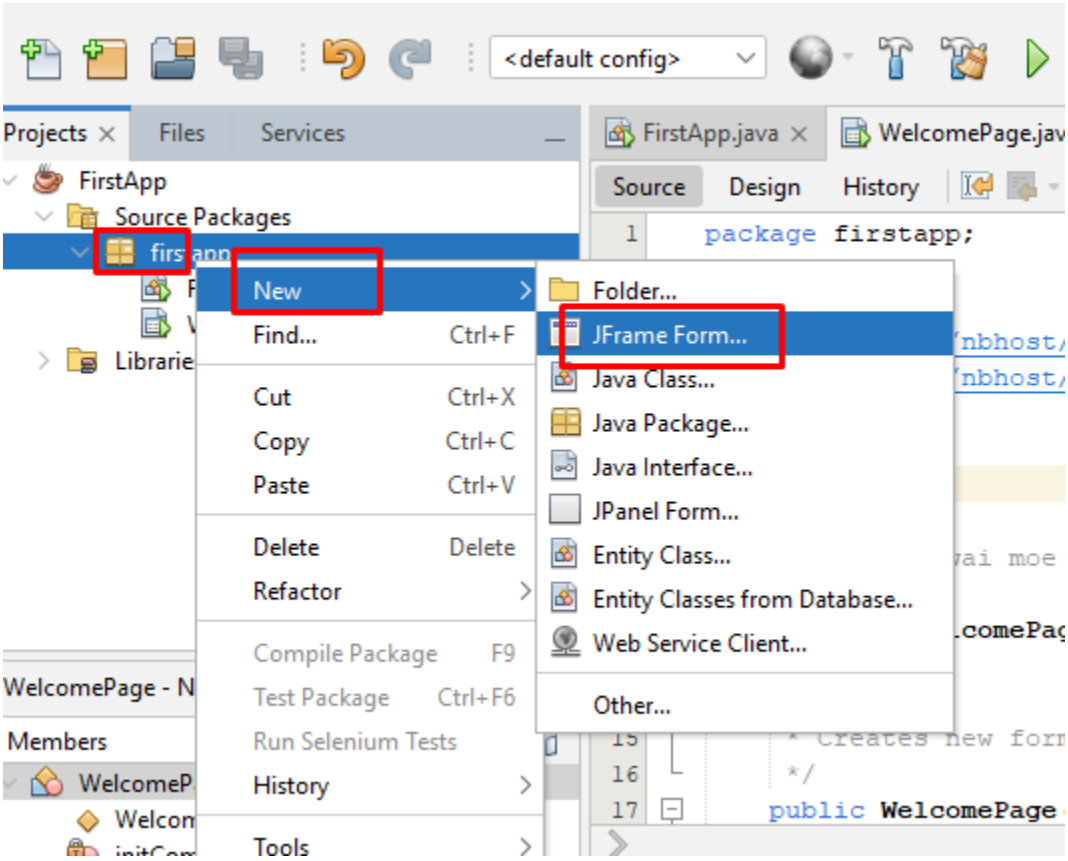
Video Lesson 2

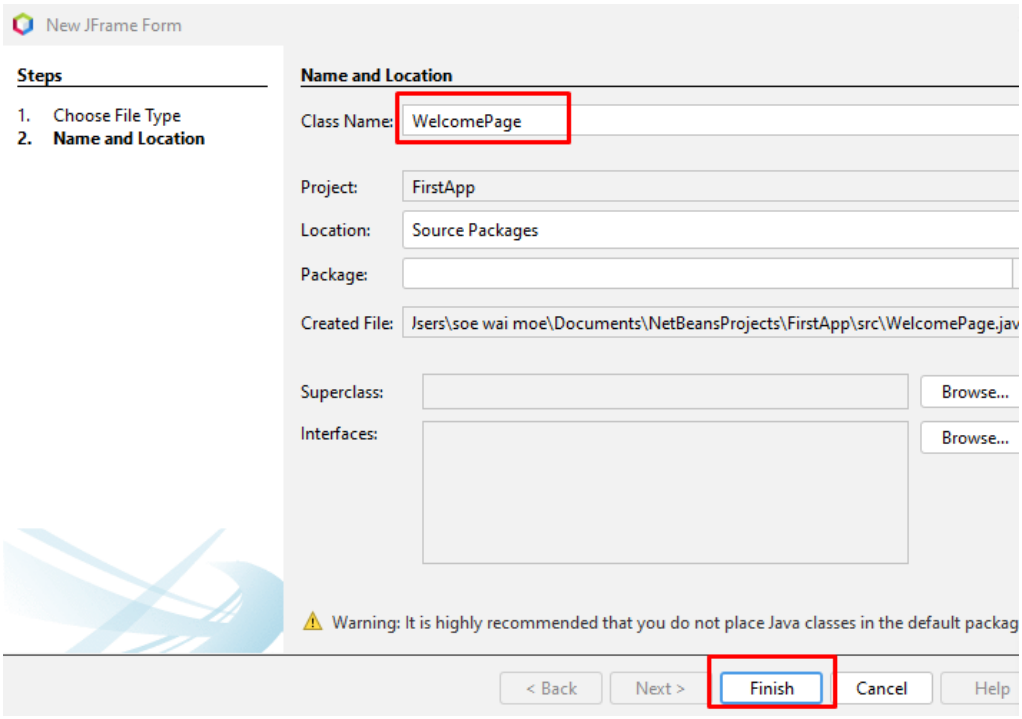
■ File->New Project

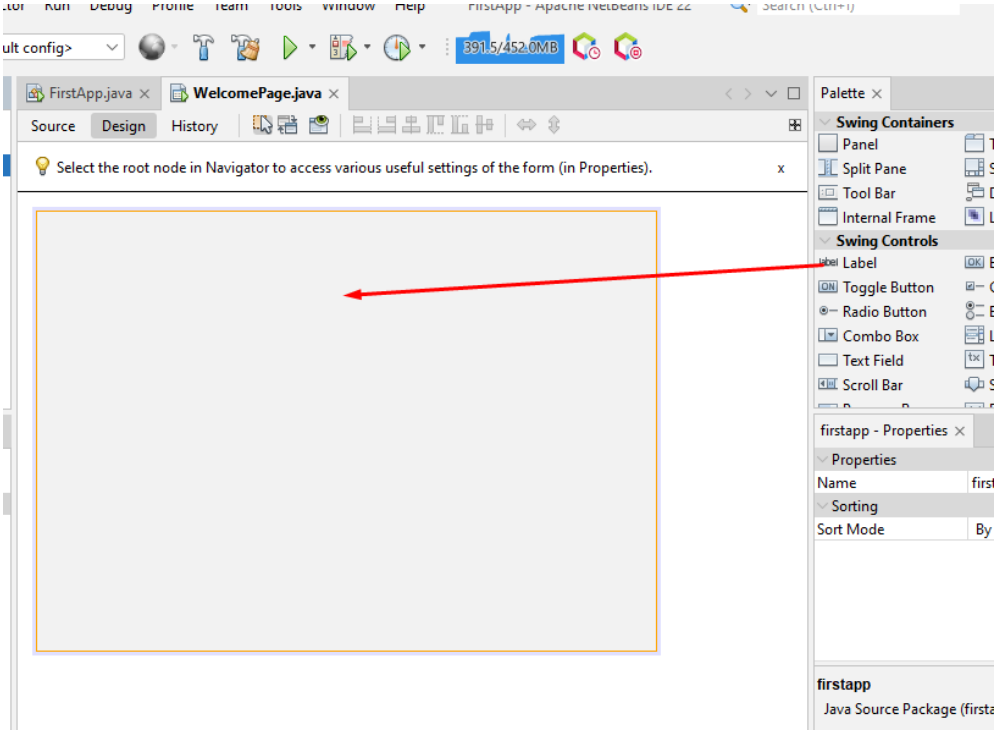


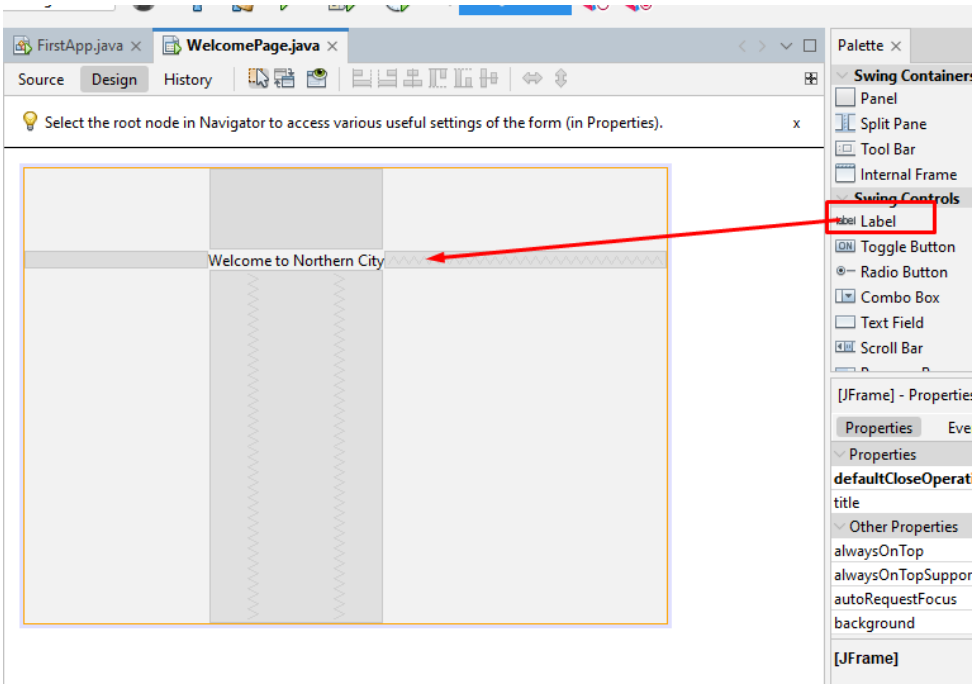


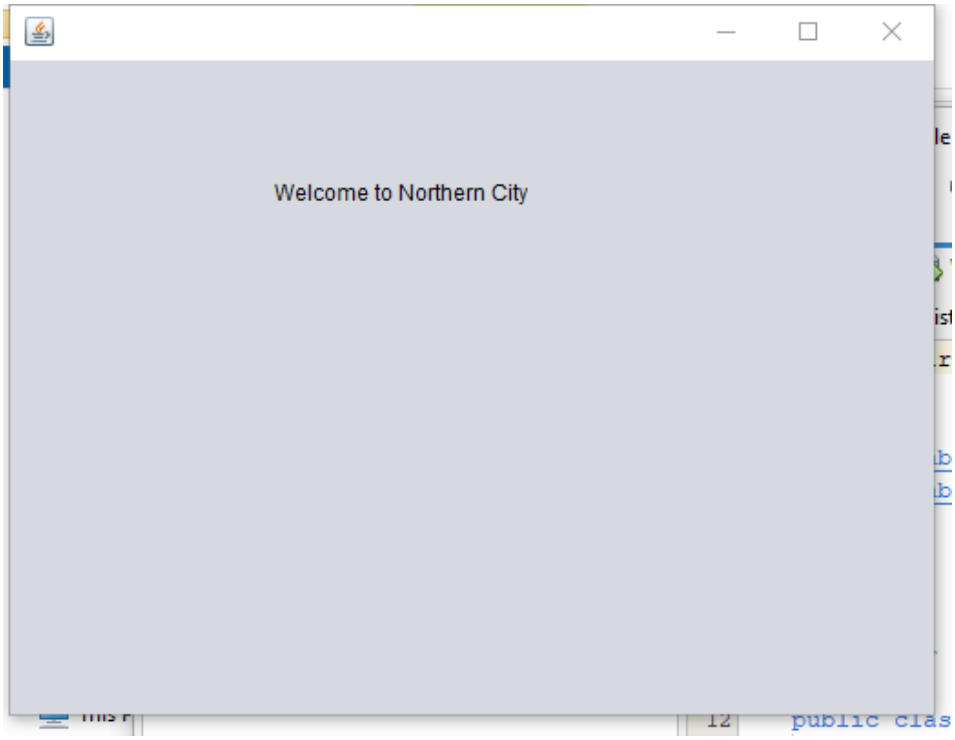

New Java Application
Steps
1. Choose Project
2. Name and Location
Name and Location
Project Name: FirstApp
Project Location: C:\Users\soe wai moe\Documents\NetBeansProjects
Browse...
Project Folder: :ers\soe wai moe\Documents\NetBeansProjects\FirstApp
Use Dedicated Folder for Storing Libraries
Libraries Folder:
Browse...
Different users and projects can share the same compilation libraries (see Help for details).
Create Main Class firstapp.FirstApp
< Back
Next >
Finish
Cancel
Help


<default config>
Projects
Files
Services
FirstApp
Source Packages
Libraries
FirstApp.java
WelcomePage.jav
Source
Design
History
1 package firstapp;
New
Find... Ctrl+F
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Delete
Refactor
Compile Package F9
Test Package Ctrl+F6
Run Selenium Tests
History
Tools
Folder...
JFrame Form...
Java Class...
Java Package...
Java Interface...
JPanel Form...
Entity Class...
Entity Classes from Database...
Web Service Client...
Other...
WelcomePage - N
Members
15 * Creates new form
16 */
17 public WelcomePage


New JFrame Form
Steps
1. Choose File Type
2. Name and Location
Name and Location
Class Name: WelcomePage
Project: FirstApp
Location: Source Packages
Package:
Created File: Jsers\soe wai moe\Documents\NetBeansProjects\FirstApp\src\WelcomePage.jav
Superclass:
Browse...
Interfaces:
Browse...
Warning: It is highly recommended that you do not place Java classes in the default packag
< Back
Next >
Finish
Cancel
Help


FirstApp.java
WelcomePage.java
Source
Design
History
Select the root node in Navigator to access various useful settings of the form (in Properties).
Palette
Swing Containers
Panel
Split Pane
Tool Bar
Internal Frame
Swing Controls
Label
Toggle Button
Radio Button
Combo Box
Text Field
Scroll Bar
firstapp - Properties
Properties
Name
Sorting
Sort Mode
firstapp
Java Source Package

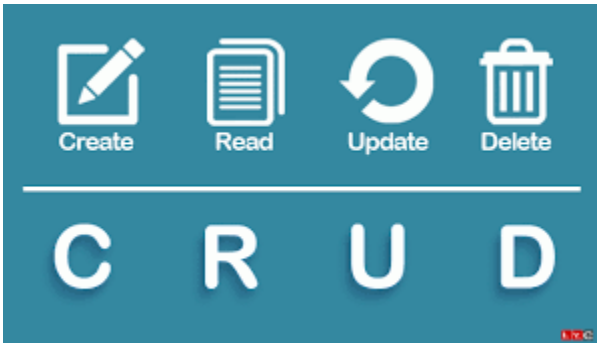




Congratulations ပါနော်။ ဒါဆို Data CRUD ဆက်ရေးဖို့ အဆင်သင့်ဖြစ်နေပါပြီ။

Data CRUD Part-1

Video Lesson 3



CRUD Part-1

- Creation of Database and User Table
- Database Connection
- Insert Data into Database
- Display Data from Database

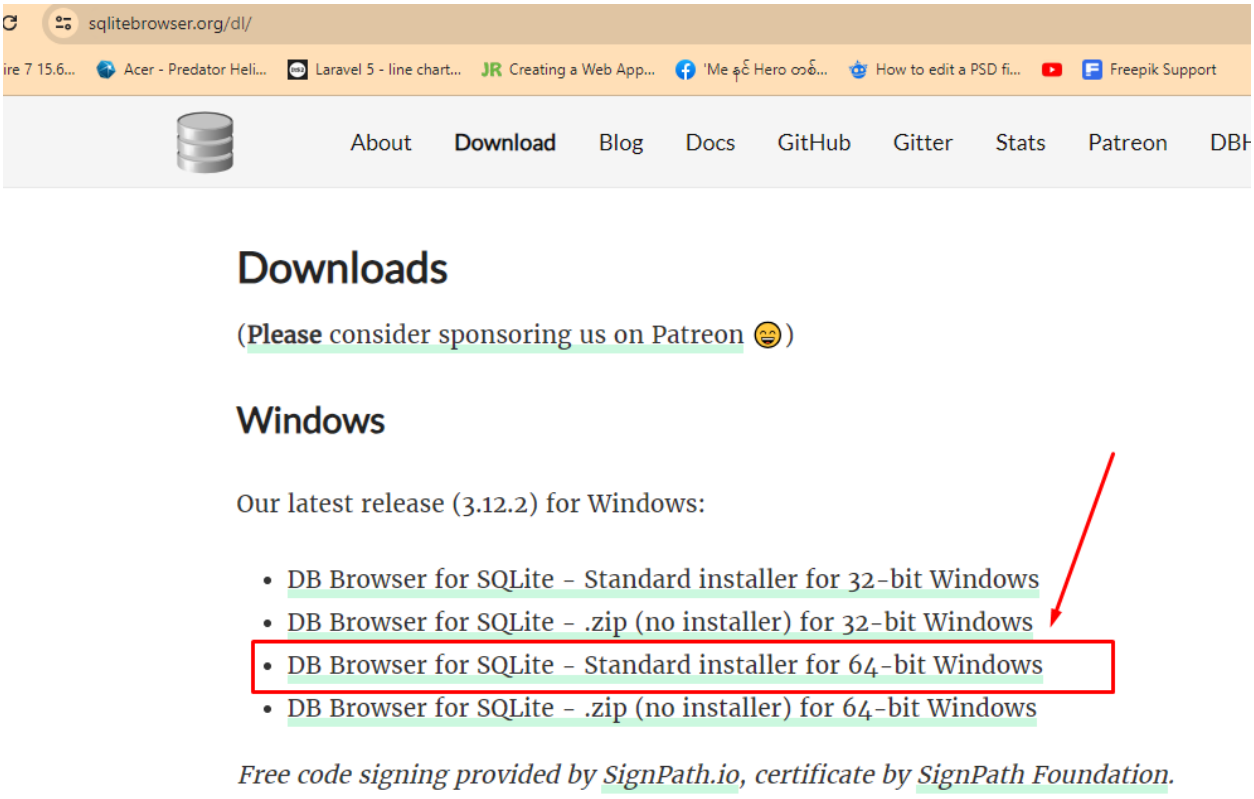
Creation of Database and Table

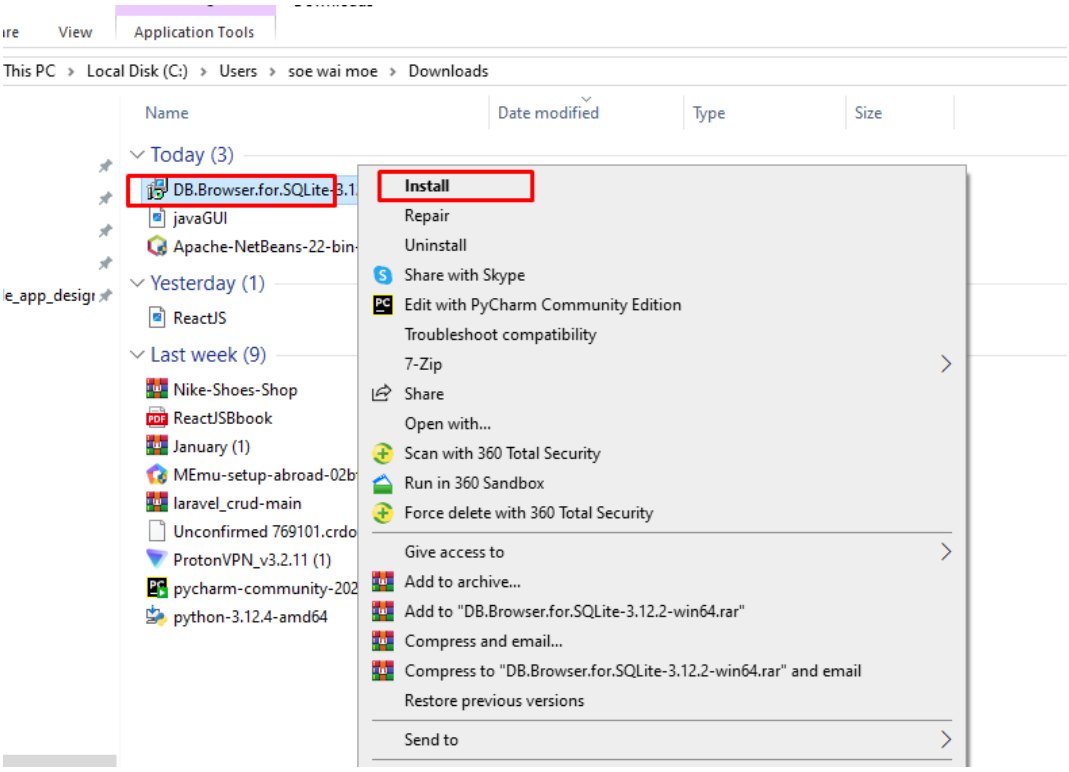
ဒီ course မှာ sqlite database ကို အသုံးပြုသွားမှာ ဖြစ်ပါတယ်။ mysql database ထက် အားသာတဲ့အချက်ကတော့ portable ဖြစ်တာရယ် ၊ Database server ကို သီးသန့် run စရာမလိုပဲ project folder ထဲမှာပဲ တစ်ခါတည်း embed လုပ်ပြီး အသုံးပြုတာဖြစ်တဲ့အတွက် development speed ပိုပြီးမြန်ဆန်မှာ ဖြစ်ပါတယ်။

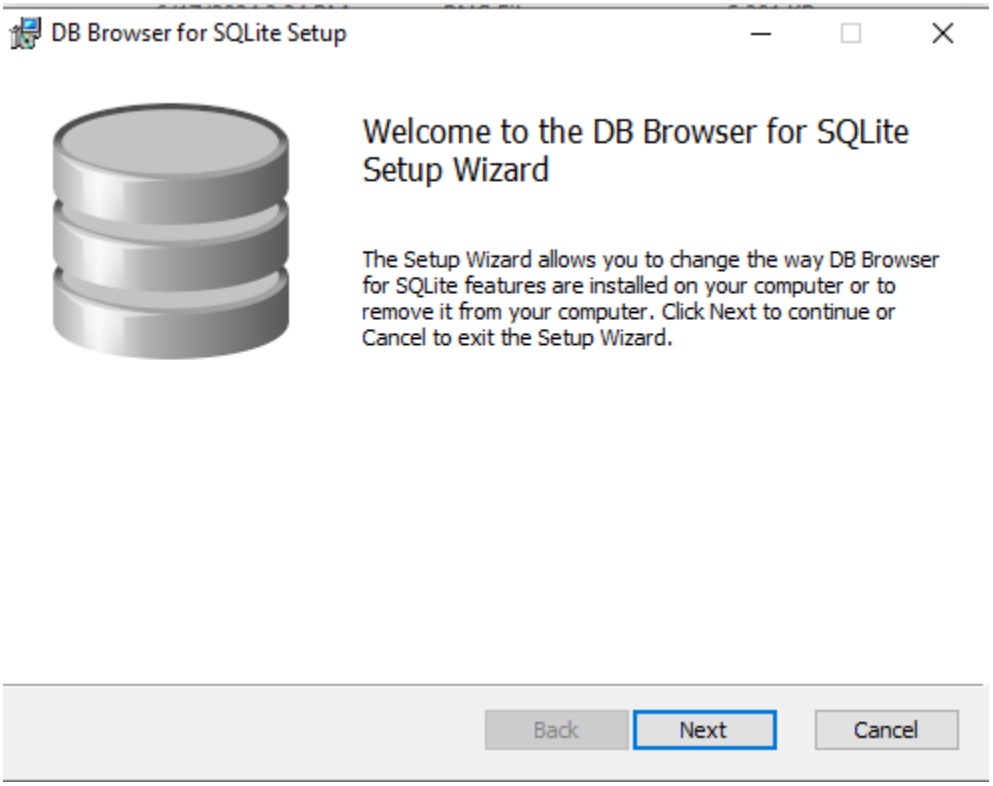
Create New Database

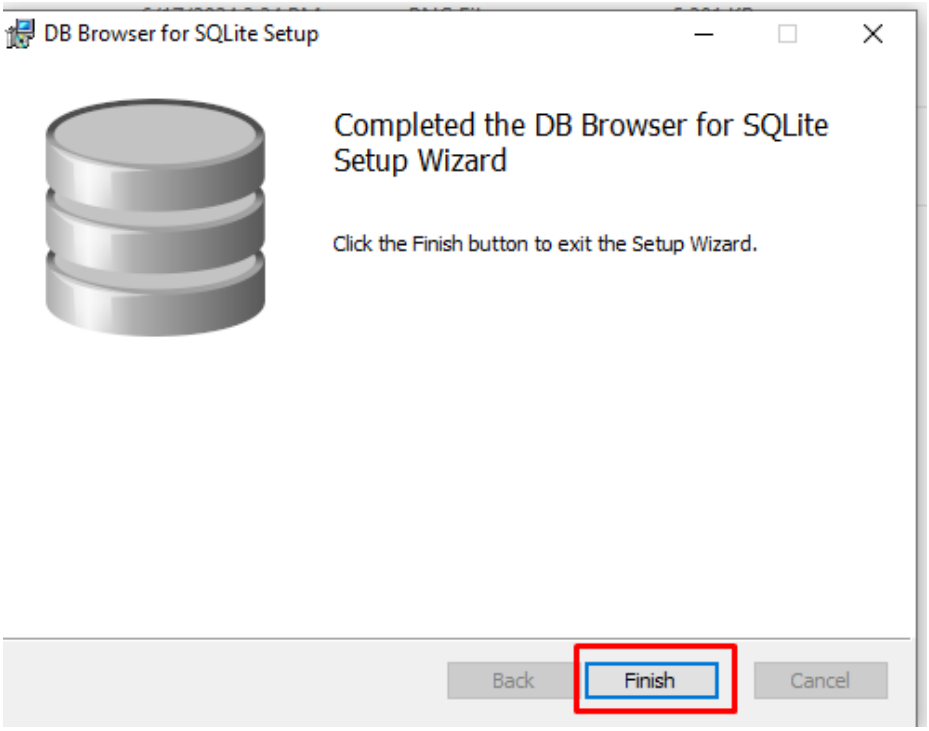
Database အသစ်ဆောက်ဖို့ရာ sqlite browser ကို အောက်က link ကို သွားပြီး ဒေါင်းရပါမယ်။

https://sqlitebrowser.org/dl/

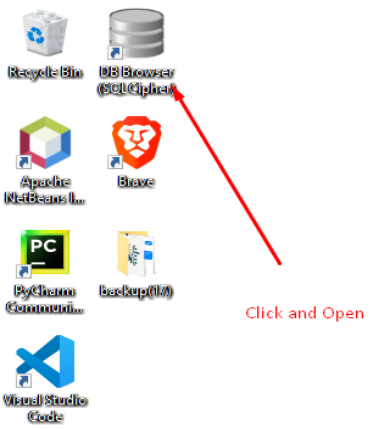


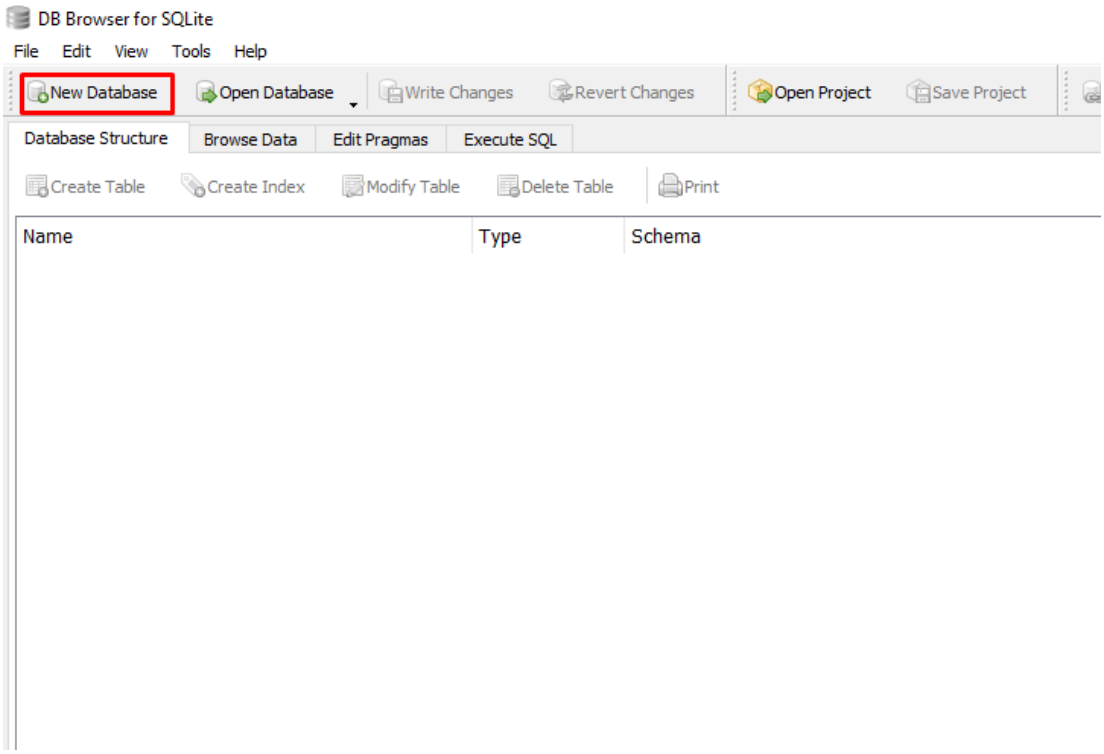

View
Application Tools
This PC › Local Disk (C:) › Users › soe wai moe › Downloads
Name
Date modified
Type
Size
Today (3)
DB.Browser.for.SQLite-3.1
javaGUI
Apache-NetBeans-22-bin-
Yesterday (1)
ReactJS
Last week (9)
Nike-Shoes-Shop
ReactJSBbook
January (1)
MEmu-setup-abroad-02b
laravel_crud-main
Unconfirmed 769101.crdo
ProtonVPN_v3.2.11 (1)
pycharm-community-202
python-3.12.4-amd64
Install
Repair
Uninstall
Share with Skype
Edit with PyCharm Community Edition
Troubleshoot compatibility
7-Zip
Share
Open with...
Scan with 360 Total Security
Run in 360 Sandbox
Force delete with 360 Total Security
Give access to
Add to archive...
Add to "DB.Browser.for.SQLite-3.12.2-win64.rar"
Compress and email...
Compress to "DB.Browser.for.SQLite-3.12.2-win64.rar" and email
Restore previous versions
Send to

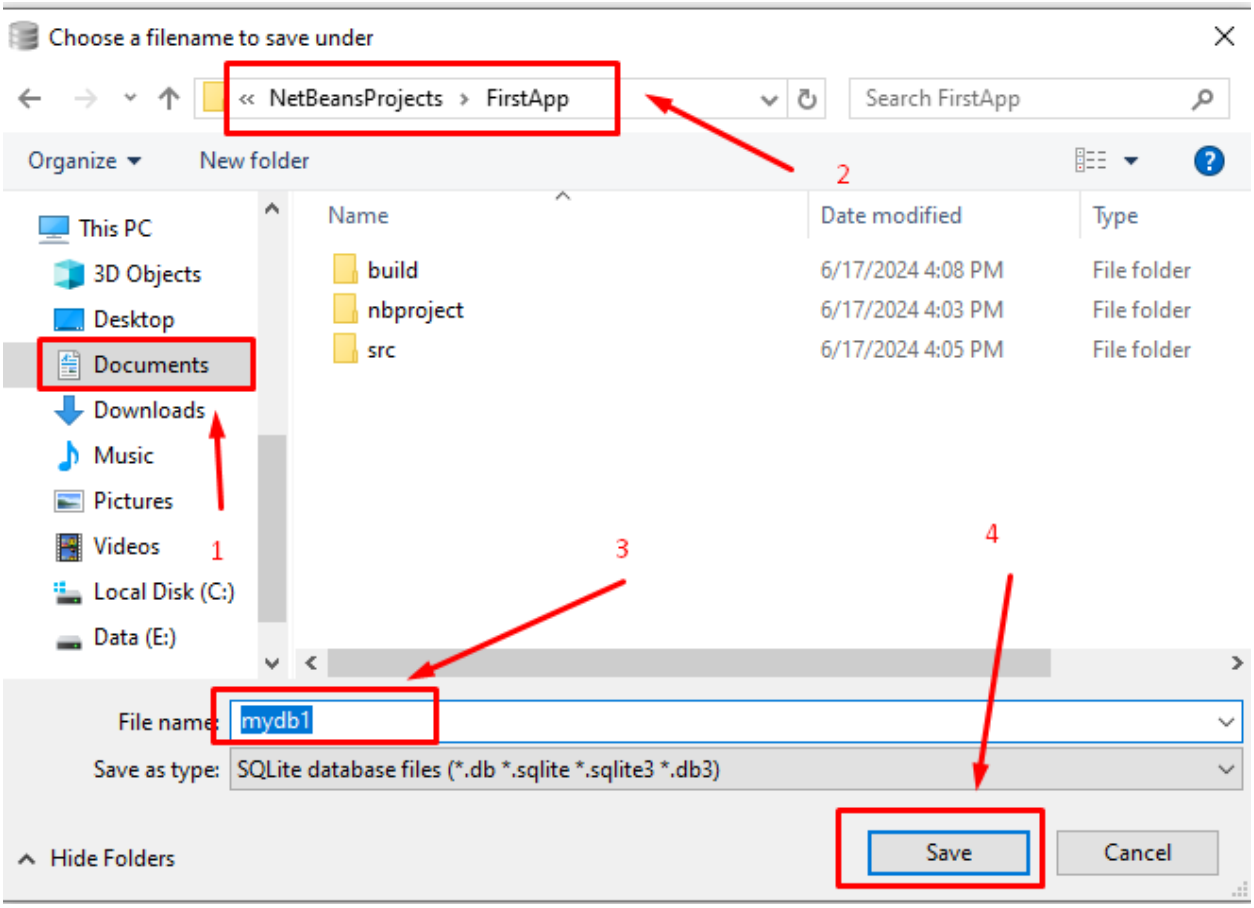

DB Browser for SQLite Setup
Welcome to the DB Browser for SQLite Setup Wizard
The Setup Wizard allows you to change the way DB Browser for SQLite features are installed on your computer or to remove it from your computer. Click Next to continue or Cancel to exit the Setup Wizard.
Back
Next
Cancel

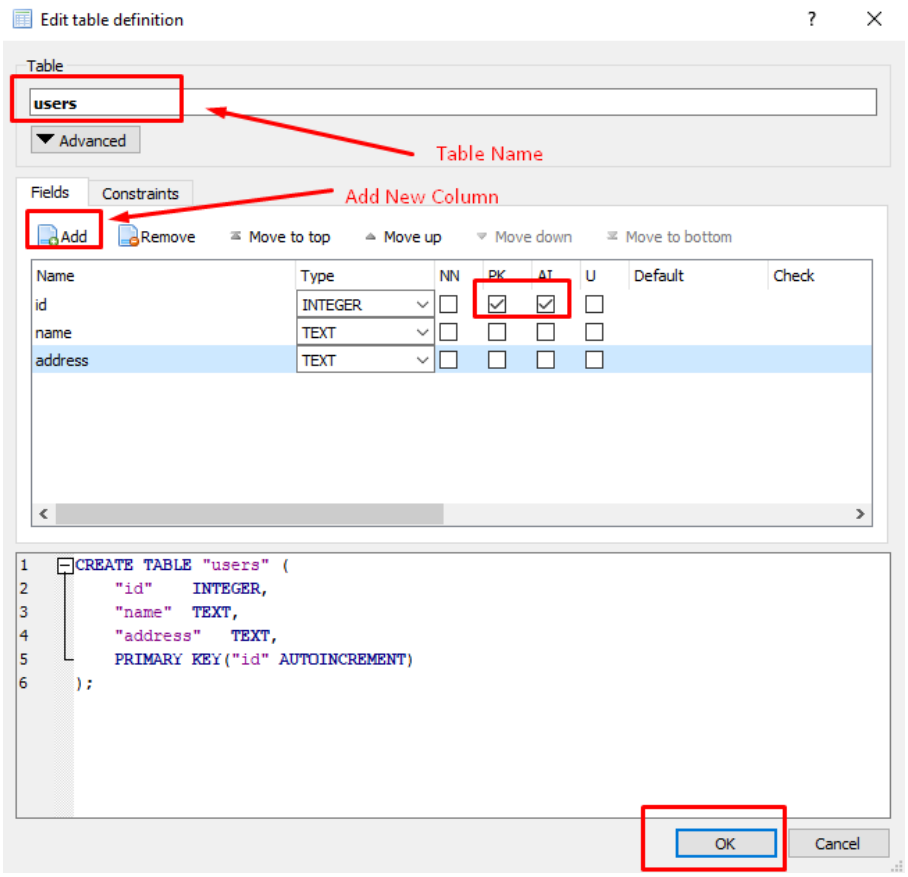


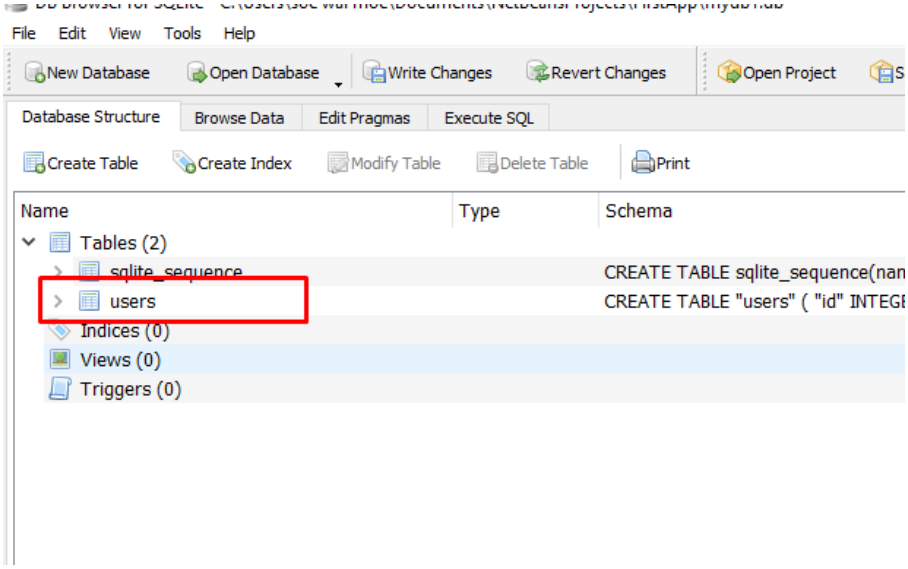
SQLite Brower ဒေါင်းပြီးသွားရင်တော့ Desktop ပေါ်က SQLite icon ကို ခေါက်ပြီး အောက်ပါအတိုင်း Database အသစ်ဆောက်ပြီး user table တစ်ခု ဆောက်ရပါမယ်။



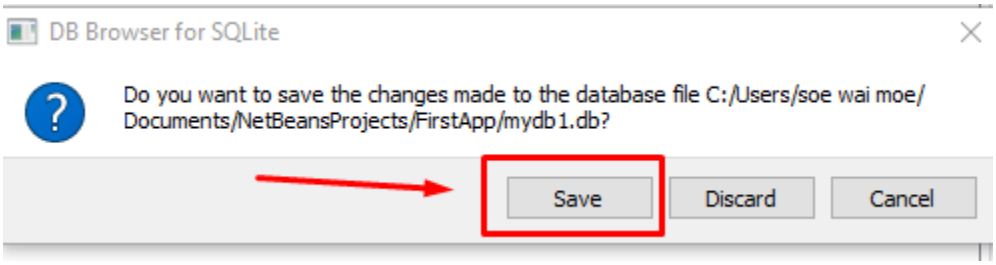

DB Browser for SQLite
File Edit View Tools Help
New Database
Open Database
Write Changes
Revert Changes
Open Project
Save Project
Database Structure
Browse Data
Edit Pragmas
Execute SQL
Create Table
Create Index
Modify Table
Delete Table
Print
Name
Type
Schema


Choose a filename to save under
« NetBeansProjects › FirstApp
Search FirstApp
Organize
New folder
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Data (E:)
Name
Date modified
Type
build
6/17/2024 4:08 PM
File folder
nbproject
6/17/2024 4:03 PM
File folder
src
6/17/2024 4:05 PM
File folder
1
2
3
4
File name:
mydb1
Save as type:
SQLite database files (*.db *.sqlite *.sqlite3 *.db3)
Hide Folders
Save
Cancel


Edit table definition
Table
users
Advanced
Table Name
Fields
Constraints
Add New Column
Add
Remove
Move to top
Move up
Move down
Move to bottom
Name
Type
NN
PK
AI
U
Default
Check
id
INTEGER
name
TEXT
address
TEXT
CREATE TABLE "users" (
"id" INTEGER,
"name" TEXT,
"address" TEXT,
PRIMARY KEY("id" AUTOINCREMENT)
);
OK
Cancel


File
Edit
View
Tools
Help
New Database
Open Database
Write Changes
Revert Changes
Open Project
Database Structure
Browse Data
Edit Pragmas
Execute SQL
Create Table
Create Index
Modify Table
Delete Table
Print
Name
Type
Schema
Tables (2)
sqlite_sequence
CREATE TABLE sqlite_sequence(nan
users
CREATE TABLE "users" ("id" INTEGE
Indices (0)
Views (0)
Triggers (0)

Database Close လုပ်တဲ့အခါ save ကို နှိပ်ပြီး အတည်ပြုပေးရပါမယ်။



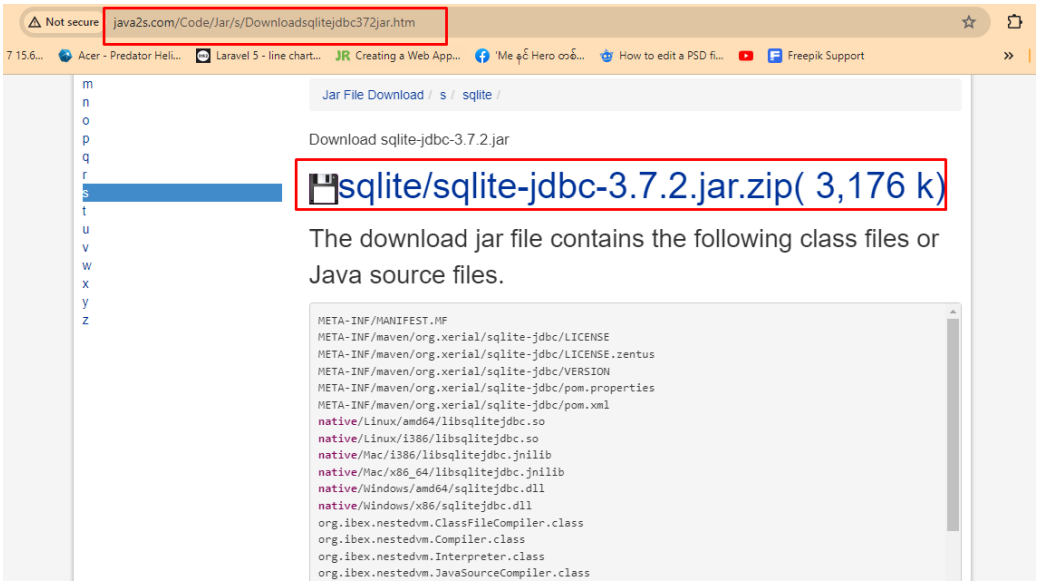
Congratulations! Database နဲ့ User Table Create လုပ်တာ အောင်မြင်သွားပါပြီ။

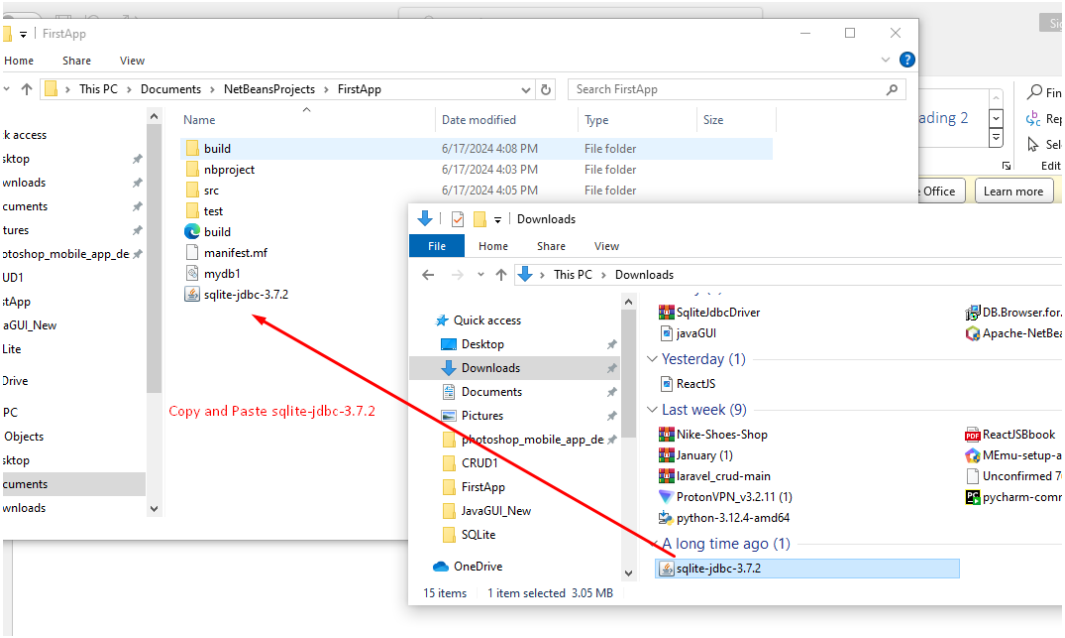
SQLite JDBC driver

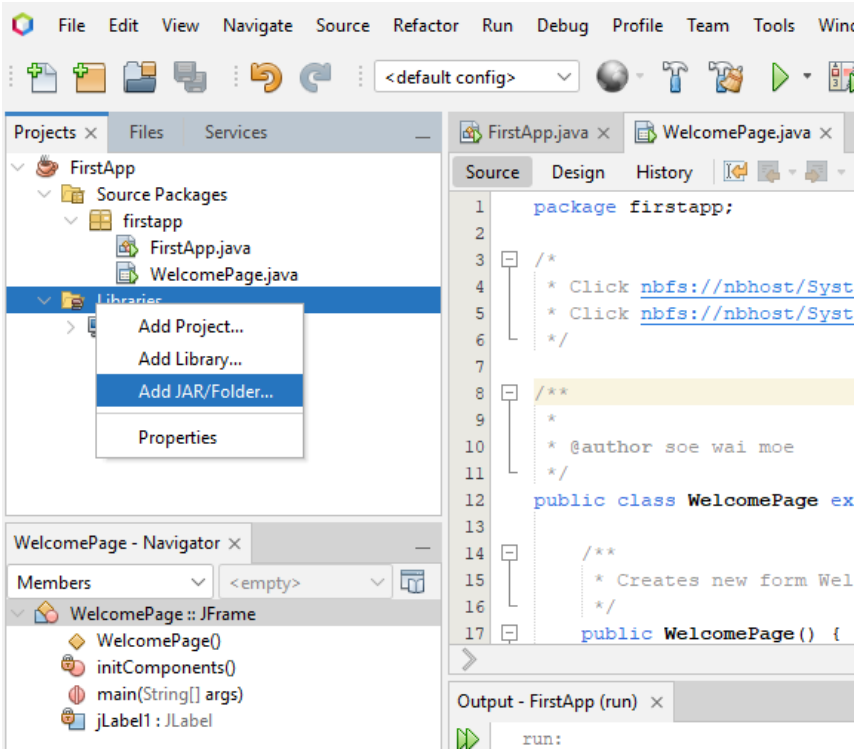
ဆက်လက်ပြီး Java JFrame နဲ့ User Interface ဆွဲပြီး Database ထဲကို data အသွင်းအထုတ်လုပ်တာ တွေ ပြုလုပ်ကြပါမယ်။ Data တွေကို အသွင်းအထုတ်မလုပ်ခင်မှာ User Interface နဲ့ Database ဘယ်လိုချိတ်ဆက် ရမလဲဆိုတာကိုအရင်လေ့လာရပါမယ်။ Application နဲ့ database ချိတ်ဆက်ဖို့ဆိုရင် SQLite JDBC driver လို့ခေါ်တဲ့ driver file(j-connector jar file) ကို အရင်ဒေါင်းထားရပါမယ်။ sqlite-jdbc jar file ကို project library ထဲမှာထည့်ပြီး Database java file တစ်ခုနဲ့ configuration လုပ်ရပါမယ်။ Application UI နဲ့ Database connection ရပြီဆိုရင် data insertion နဲ့ Data Retrieval (Data Display) တို့ကို ဆက်ပြီး ရေးကြပါမယ်။

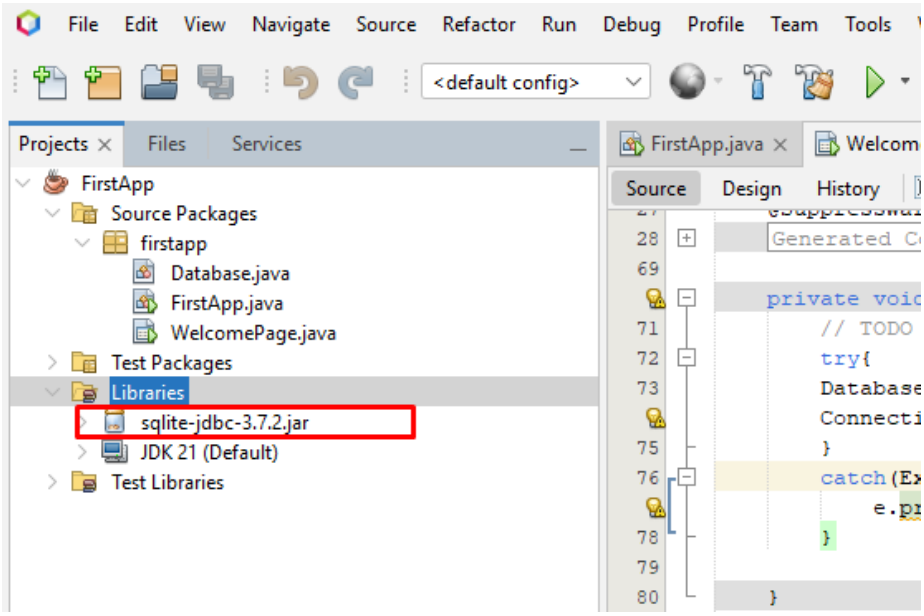
Sqlite jdbc driver download link:

http://www.java2s.com/Code/Jar/s/Downloadsqlitejdbc372jar.htm


Not secure
java2s.com/Code/Jar/s/Downloadsqlitejdbc372jar.htm
Jar File Download / s / sqlite /
Download sqlite-jdbc-3.7.2.jar
sqlite/sqlite-jdbc-3.7.2.jar.zip(3,176 k)
The download jar file contains the following class files or Java source files.
META-INF/MANIFEST.MF
META-INF/maven/org.xerial/sqlite-jdbc/LICENSE
META-INF/maven/org.xerial/sqlite-jdbc/LICENSE.zentus
META-INF/maven/org.xerial/sqlite-jdbc/VERSION
META-INF/maven/org.xerial/sqlite-jdbc/pom.properties
META-INF/maven/org.xerial/sqlite-jdbc/pom.xml
native/Linux/amd64/libsqlitejdbc.so
native/Linux/i386/libsqlitejdbc.so
native/Mac/i386/libsqlitejdbc.jnilib
native/Mac/x86_64/libsqlitejdbc.jnilib
native/Windows/amd64/sqlitejdbc.dll
native/Windows/x86/sqlitejdbc.dll
org.ibex.nestedvm.ClassFileCompiler.class
org.ibex.nestedvm.Compiler.class
org.ibex.nestedvm.Interpreter.class
org.ibex.nestedvm.JavaSourceCompiler.class

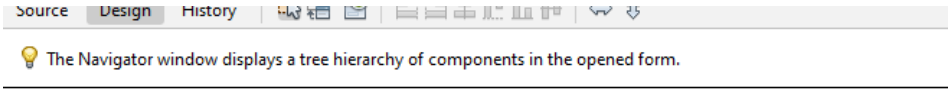

FirstApp
This PC › Documents › NetBeansProjects › FirstApp
Search FirstApp
Name
Date modified
Type
Size
build
nbproject
src
test
build
manifest.mf
mydb1
sqlite-jdbc-3.7.2
Copy and Paste sqlite-jdbc-3.7.2
Downloads
This PC › Downloads
Quick access
Desktop
Downloads
Documents
Pictures
CRUD1
FirstApp
JavaGUI_New
SQLite
OneDrive
Yesterday (1)
ReactJS
Last week (9)
Nike-Shoes-Shop
January (1)
laravel_crud-main
ProtonVPN_v3.2.11 (1)
python-3.12.4-amd64
A long time ago (1)
sqlite-jdbc-3.7.2
15 items
1 item selected 3.05 MB

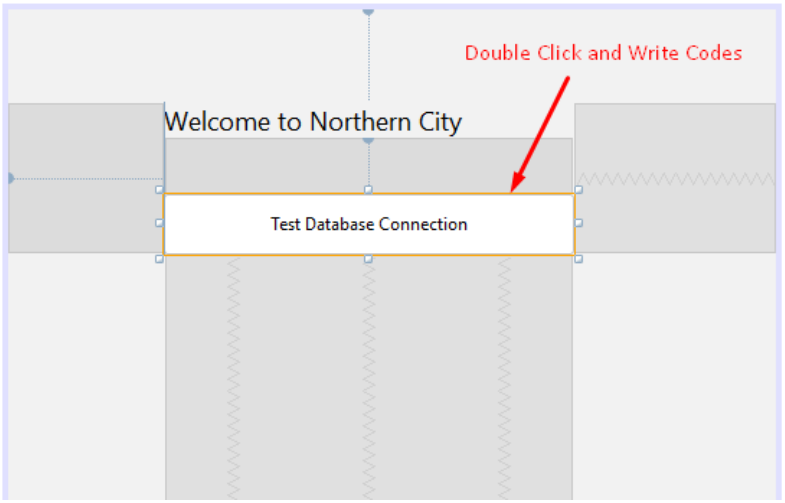

File Edit View Navigate Source Refactor Run Debug Profile Team Tools
<default config>
Projects
Files
Services
FirstApp
Source Packages
firstapp
FirstApp.java
WelcomePage.java
Add Project...
Add Library...
Add JAR/Folder...
Properties
WelcomePage - Navigator
Members
<empty>
WelcomePage :: JFrame
WelcomePage()
initComponents()
main(String[] args)
jLabel1 : JLabel
FirstApp.java
WelcomePage.java
Source
Design
History
package firstapp;
/**
* @author soe wai moe
*/
public class WelcomePage ex
public WelcomePage() {
Output - FirstApp (run)
run:


File Edit View Navigate Source Refactor Run Debug Profile Team Tools
<default config>
Projects
Files
Services
FirstApp
Source Packages
firstapp
Database.java
FirstApp.java
WelcomePage.java
Test Packages
Libraries
sqlite-jdbc-3.7.2.jar
JDK 21 (Default)
Test Libraries
FirstApp.java
Source
Design
History
Generated C
private voic
// TODO
try{
Database
Connecti
}
catch(Ex
e.pr
}
}

Database.java

```
package firstapp;


import java.sql.Connection;
import java.sql.*;

/**
 *
 * @author soe wai moe
 */
public class Database {

    public Connection getConnected(){
    Connection conn=null;
    try{

       Class.forName("org.sqlite.JDBC");
       conn=DriverManager.getConnection("jdbc:sqlite:mydb1.db");

       if(conn!=null){
          System.out.println("Database Connection Success...");
       }

    }catch(Exception e){
       e.printStackTrace();
    }
    return conn;

   }


}
```

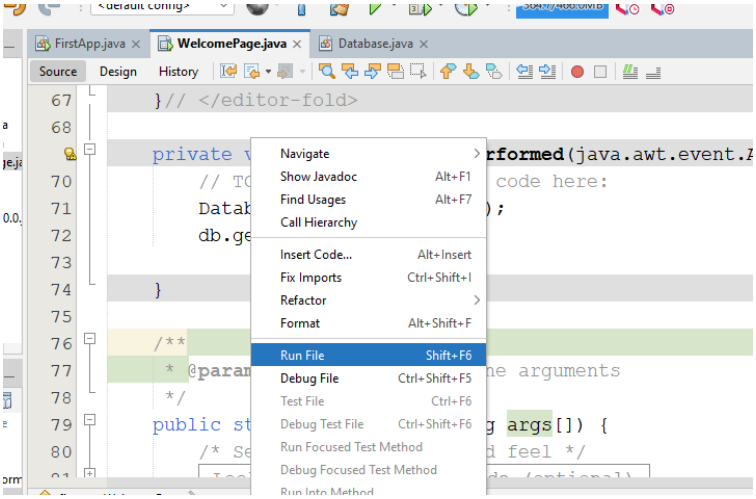


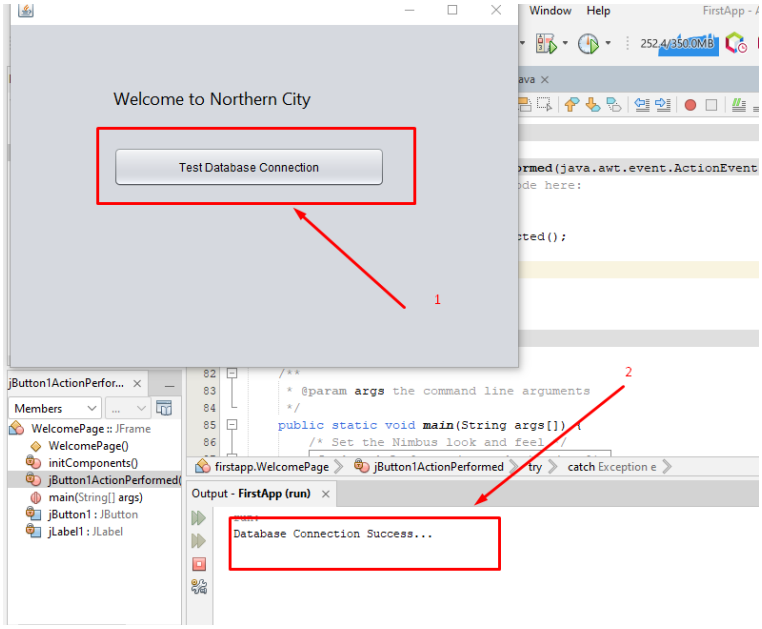


Test Database Connection Button ကို ၂ ချက် ခေါက်ပြီး အောက်က code ကို ရေးရပါမယ်။

Database Connection ရပြီဆိုကာမှ CRUD operation ကို ဆက်ရေးရမှာ မို့ပါ။

```
private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
    try{
    Database db=new Database();
    Connection conn=db.getConnected();
    }
    catch(Exception e){
       e.printStackTrace();
    }

}
```


FirstApp.java
WelcomePage.java
Database.java
Source
Design
History
Navigate
Show Javadoc Alt+F1
Find Usages Alt+F7
Call Hierarchy
Insert Code... Alt+Insert
Fix Imports Ctrl+Shift+I
Refactor
Format Alt+Shift+F
Run File Shift+F6
Debug File Ctrl+Shift+F5
Test File Ctrl+F6
Debug Test File Ctrl+Shift+F6
Run Focused Test Method
Debug Focused Test Method


Welcome to Northern City
Test Database Connection
1
2
Database Connection Success...

Congratulations! Database Connection Success ဖြစ်သွားပြီဆိုတော့ Data CRUD operation ကို စရေးလို့ရပါပြီ။ CRUD ရဲ့ အရည်ကောက်က Create ၊ Read ၊ Update နဲ့ Delete ဖြစ်ပါတယ်။ Application တစ်ခု ရေးတော့မယ်ဆိုရင် CRUD operation က အခြေခံကျတဲ့ လုပ်ဆောင်ချက်တွေဖြစ်ပါတယ်။ ပြီးမှ photo upload၊ data search ၊ data pagination ၊ data filter ၊ menu navigation ၊ authentication function ၊ application User Interface တွေကို တစ်ခုပြီး တစ်ခု ထည့်ပြီး application function နဲ့ application design တွေအဆင့်မြင့်လာအောင် upgrade လုပ်သွားရမှာ ဖြစ်ပါတယ်။

Insert Data into Database

■ Project Structure

--- project file

--- src --- Database.java

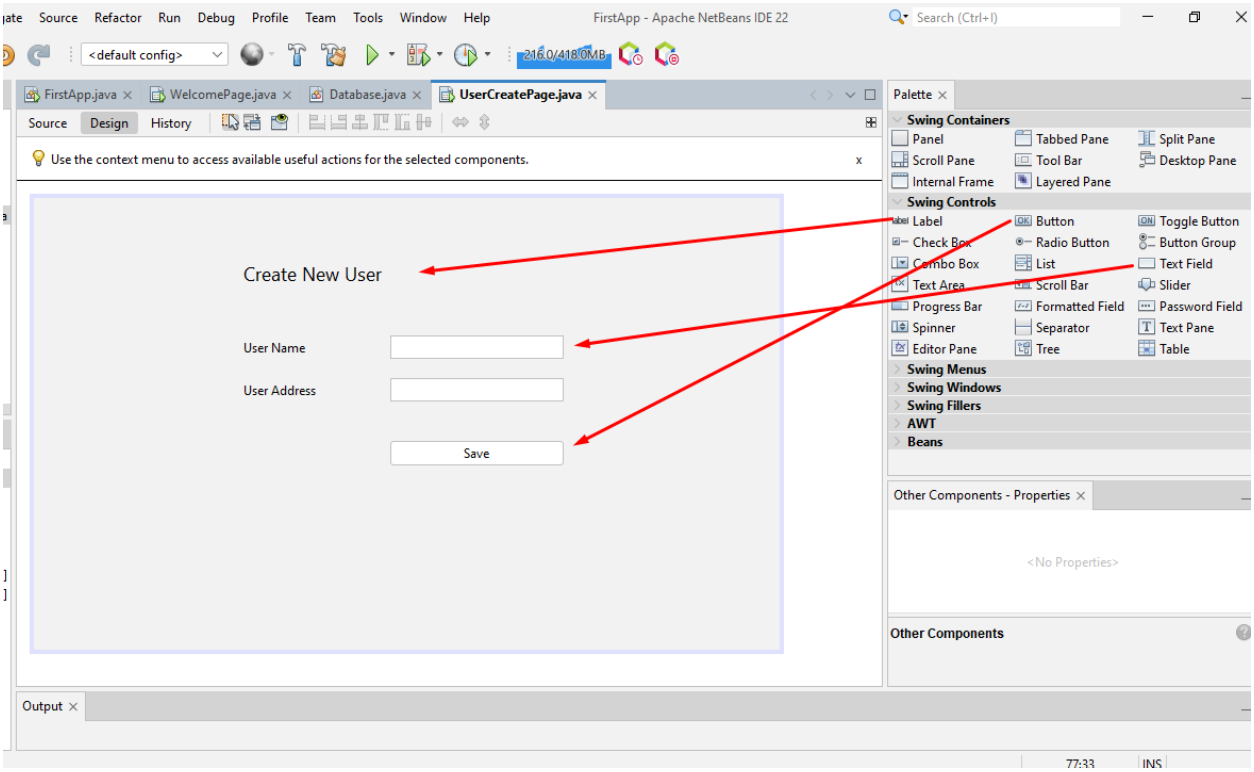
--- UserCreatePage.java

--- libraries --- sqlite-jdbc-3.7.2.jar

Database.java

```
package firstapp;

import java.sql.Connection;
import java.sql.*;

public class Database {

    public Connection getConnected(){
    Connection conn=null;
    try{

        Class.forName("org.sqlite.JDBC");
        conn=DriverManager.getConnection("jdbc:sqlite:mydb1.db");

        if(conn!=null){
            System.out.println("Database Connection Success...");
        }

    }catch(Exception e){
        e.printStackTrace();
    }
    return conn;

   }


}
```

UserCreatePage.java



Save Button ကို ၂ ချက် ဆက်တိုက်ခေါက်ပြီး အောက်က code ကို ရေးရပါမယ်။

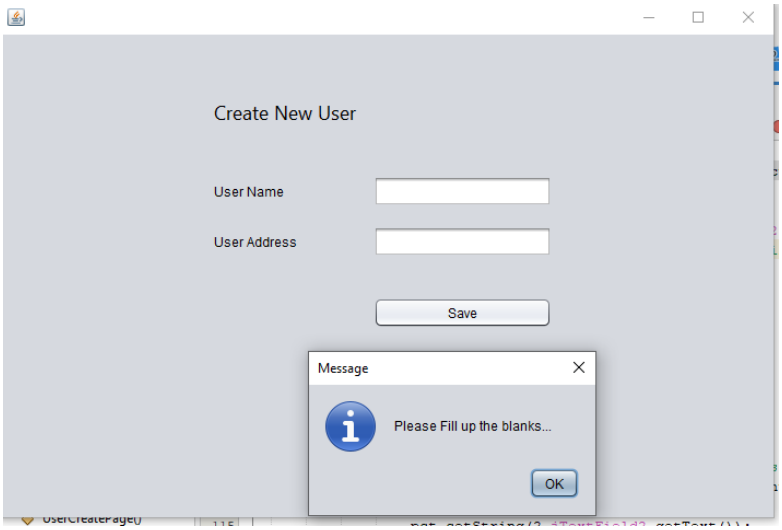
Input field validation ကို အရင်ဆုံးလုပ်ရပါမယ်။ input field တွေမှာ ဘာမှ မထည့်ပဲ save button ကို နှိပ်လိုက်ရင် Please fill up the blanks ဆိုတဲ့ message dialog box ကျလာပါမယ်။ textfield validation pass ဖြစ်သွားရင် တော့ insert data process ကို ဆက်လုပ်ရပါမယ်။

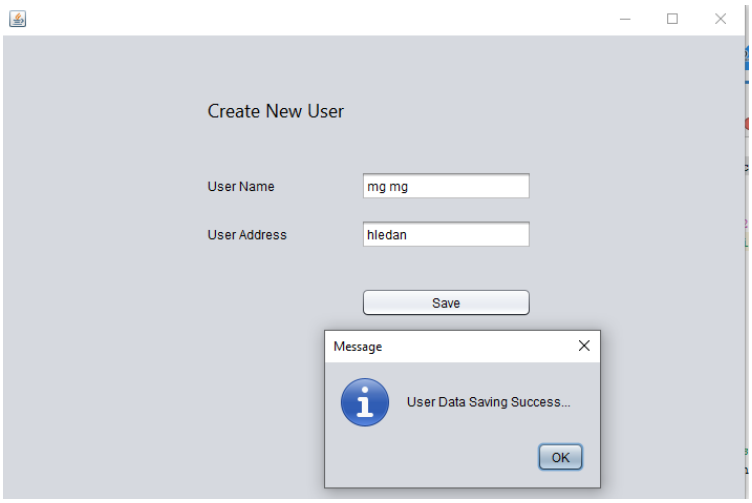
Insert data process မှာ အဆင့်၃ ဆင့်ရှိပါတယ်။ အဲဒါတွေကတော့ -

1. Database Connection
2. Sql Commands (Insert , Select, Update, Delete)
3. Execution SQL command

တို့ဖြစ်ပါတယ်။

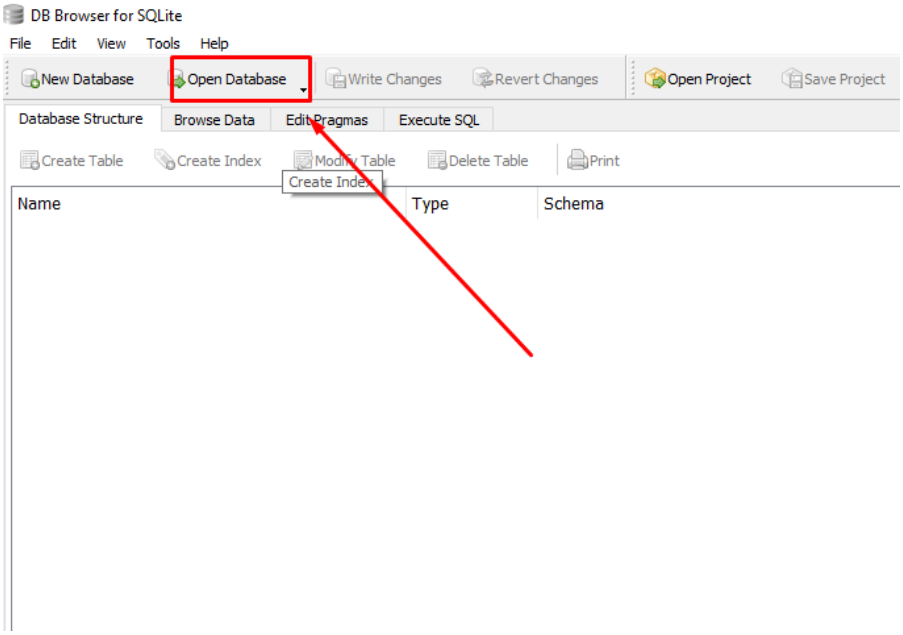
```
private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:

    if(jTextField1.getText().equals("") || jTextField2.getText().equals("")){
      JOptionPane.showMessageDialog(null, "Please Fill up the blanks...");
    }
    else{

      //process insert data

      try{

        Database db=new Database();
        Connection conn=db.getConnected();

        String sql="INSERT into users (name,address) values(?,?)";
        PreparedStatement pst=conn.prepareStatement(sql);
        pst.setString(1,jTextField1.getText());
        pst.setString(2,jTextField2.getText());
        pst.execute();


       JOptionPane.showMessageDialog(null, "User Data Saving Success...");

      }
      catch(Exception e){
        e.printStackTrace();
      }

    }
```

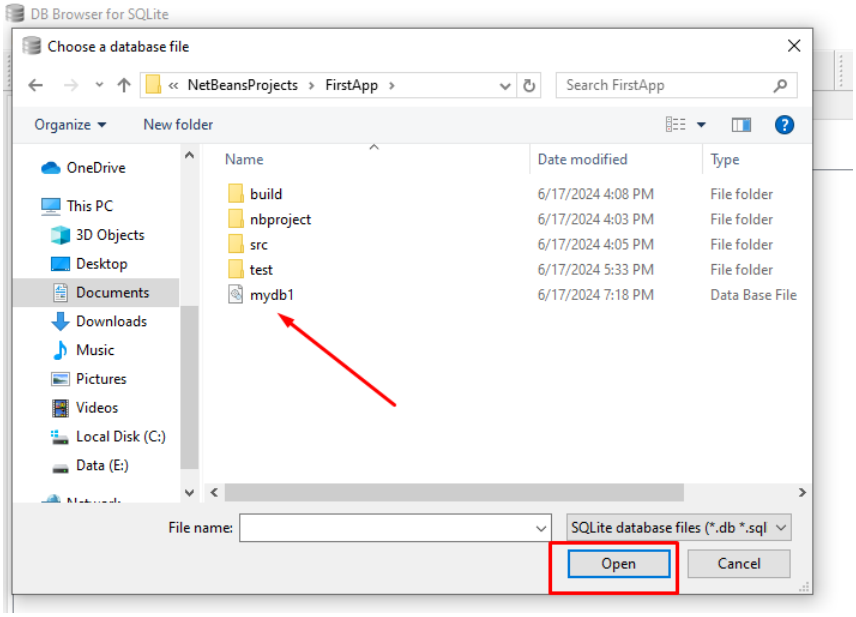


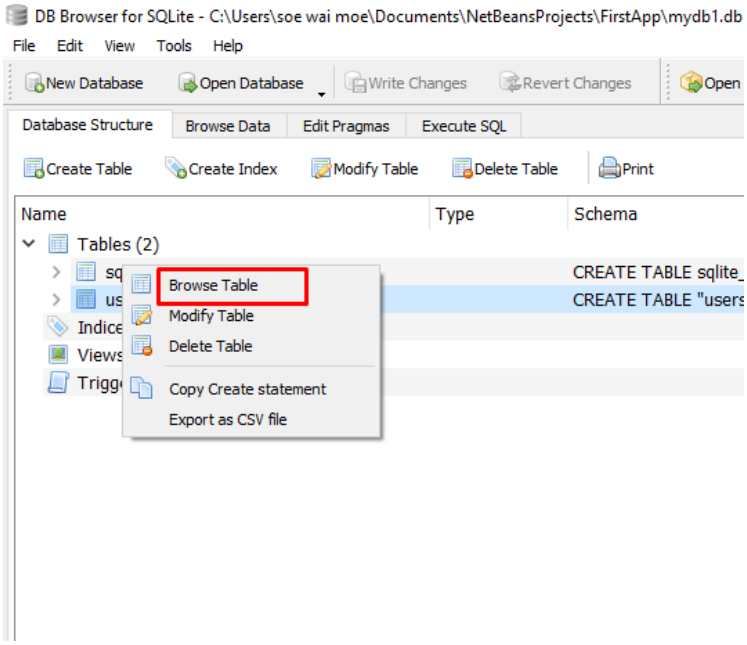


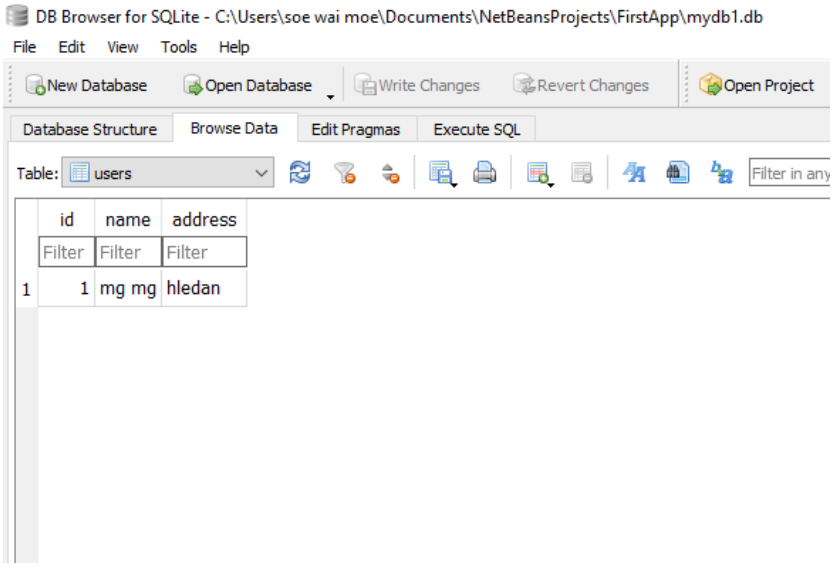
ဒါဆိုအခု Database ထဲကို data ရောက်မရောက်သွားကြည့်ရအောင်နော်။

Desktop ပေါ်က SQLite DB browser ကို ဖွင့်ရအောင်။


DB Browser for SQLite
File Edit View Tools Help
New Database
Open Database
Write Changes
Revert Changes
Open Project
Save Project
Database Structure
Browse Data
Edit Pragmas
Execute SQL
Create Table
Create Index
Modify Table
Delete Table
Print
Create Index
Name
Type
Schema


DB Browser for SQLite
Choose a database file
NetBeansProjects › FirstApp ›
Search FirstApp
Organize
New folder
OneDrive
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Data (E:)
Name
Date modified
Type
build 6/17/2024 4:08 PM File folder
nbproject 6/17/2024 4:03 PM File folder
src 6/17/2024 4:05 PM File folder
test 6/17/2024 5:33 PM File folder
mydb1 6/17/2024 7:18 PM Data Base File
File name:
SQLite database files (*.db *.sql
Open
Cancel





Congratulations! Insert Data Process အောင်မြင်သွားပါပြီ။ ဆက်ပြီးတော့ Data Retrieval process (Display Data) ကို ဆက်လုပ်ရအောင်နော်။

Display Data from Database

ID	Name	Address
1	Mg Mg	Hledan
2	Su Su	Innsein
3	Aung Aung	San Chaung

■ Project Structure

--- project file

--- src --- Database.java

--- UserCreatePage.java

--- UserIndexPage.java

--- libraries --- sqlite-jdbc-3.7.2.jar

UserIndexPage.java

Data Loading

UserIndexPage က database ထဲက user data တွေကို ဆွဲထုတ်ပြီး jTable မှာ ထုတ်ပြရမှာ ဖြစ်ပါတယ်။ ဦးစွာ loadUsers() ဆိုတဲ့ method ကို contructor ထဲမှာ ရေးရပါမယ်။ loadUsers() method အပေါ်မှာ mouse pointer ကို ထောက်ပြီး double click လုပ်လိုက်ရင် သူ့ရဲ့ method implemetation body ကို UserIndexPage ရဲ့အောက်ဆုံးပိုင်းမှာ generate လုပ်ပေးမှာ ဖြစ်ပါတယ်။

Database ထဲက data တွေကို ဆွဲထုတ်ပြီး jTable မှာ dynamically populate လုပ်နိုင်ဖို့အတွက်

DefaultTableModel ကိုအသုံးပြုရပါမယ်။ Table heading column တွေအတွက်ကတော့ String array ကို အသုံးပြုရမှာ ဖြစ်ပါတယ်။

Database ထဲက data တွေကို ResultSet library နဲ့ ဆွဲထုတ်ရတာဖြစ်ပြီး DefaultTableModel ထဲကို တစ် row ပြီး တစ် row အောက်ပါအတိုင်း ပြန်ထည့်ရပါမယ်။

```
=>public DefaultTableModel model=new DefaultTableModel();

...

while(rs.next()){
        String name=rs.getString("name");
        String address=rs.getString("address");
        model.addRow(new Object[]{id,name,address});
}
```

Page Redirection

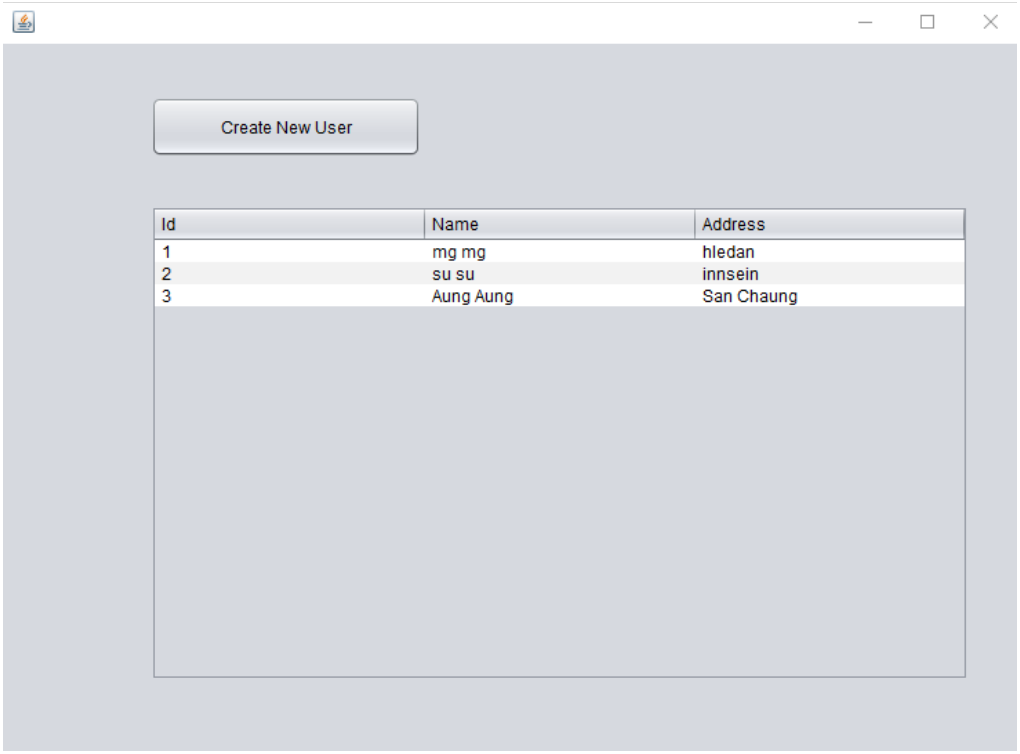
Page Redirection အတွက် this.dispose() method ကိုအသုံးပြုရပါမယ်။ သွားချင်တဲ့ page ကို redirect လုပ်နိုင်ဖို့အတွက် လက်ရှိဖွင့်ထားတဲ့ application window ကို this.dispose() method နဲ့ ပိတ်ပြီး သွားချင်တဲ့ page နာမည်ကို အောက်ပါအတိုင်းဖွင့်လို့ရပါတယ်။

```
NewPage newPage=new NewPage();
newPage.setVisible(true);
```

```
//////////////////////////////////////////////////////////////////////////
import java.sql.*;
import java.sql.Statement;
import java.sql.ResultSet;
//////////////////////////////////////////////////////////////////////////
//for populating data dynamically
  public DefaultTableModel model=new DefaultTableModel();
// for table heading columns
   public String[] cols={"Id","Name","Address"};
```

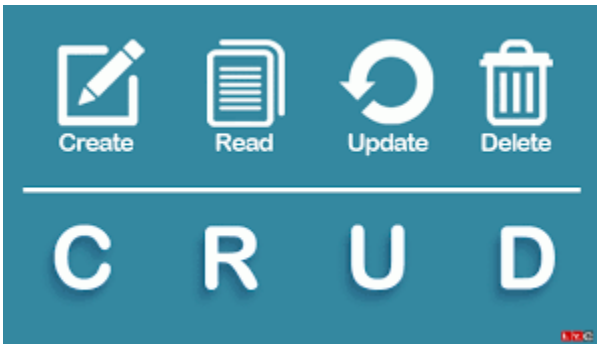
```
//contructor
    public UserIndexPage() {
        initComponents();
        loadUsers();
    }
////////////////////////////////////////////////////////////////////
private void loadUsers() {

         model.setColumnIdentifiers(cols);

        try{
            Database  db=new Database();
            Connection conn=db.getConnected();

            String sql="SELECT * from users";
            Statement stmt=conn.createStatement();
            ResultSet rs=stmt.executeQuery(sql);
            while(rs.next()){

                int id=rs.getInt("id");
                String name=rs.getString("name");
                model.addRow(new Object[]{id,name});
            }

            jTable1.setModel(model);
        }
        catch(Exception e){
            e.printStackTrace();
        }
    }

////////////////////////////////////////////////
```

Output:


Create New User
Id
Name
Address
1
mg mg
hledan
2
su su
innsein
3
Aung Aung
San Chaung

Data CRUD Part-2

🎬Video Lesson 4



CRUD Part-2

- Popup Menu
- Edit Data Process
- Delete Data Process

■ Project Structure

--- project file

--- src --- Database.java

--- UserCreatePage.java

--- UserIndexPage.java

--- UserEditPage.java (Manual Codes)

--- libraries --- sqlite-jdbc-3.7.2.jar

CRUD Part-2 မှာ Data Edit နဲ့ Data Delete လုပ်ဆောင်ချက်တွေကို implement လုပ်သွားမှာဖြစ်ပါတယ်။ ပုံမှန်အားဖြင့် edit process ကို Jframe စာမျက်နှာ အသစ်နဲ့ ဆောက်လုပ်ကြပေမယ့် ဒီလေ့ကျင့်ခန်းမှာတော့ popup menu အနေနဲ့ အသုံးပြုကြမှာ ဖြစ်ပါတယ်။ အဲဒါကြောင့် Popup menu တွေကို အောက်ပါအတိုင်း UserIndexPage ရဲ့ constructor အပေါ်မှာ ကြေငြာပေးရပါမယ်။

```
public JPopupMenu popup=new JPopupMenu();
public  JMenuItem editMenu=new JMenuItem("Edit User ");
public JMenuItem deleteMenu=new JMenuItem("Delete User");
```

Popup menu implementation အပိုင်းကိုတော့ jTable ထဲကို setComponentPopupMenu() method နဲ့ အောက်ပါအတိုင်း အသက်သွင်းရပါမယ်။

```
        jTable1.setComponentPopupMenu(popup);
```

Editing Process

```
//////////////////////////////////////////////////////////////////////
popup.add(editMenu);
editMenu.addActionListener(new ActionListener(){
            @Override
            public void actionPerformed(ActionEvent e) {
                //editing process
            }
});
//////////////////////////////////////////////////////////////////////
```

Popup menu ကို အသက်သွင်းပြီးတာနဲ့ popup menu item ကို listener ထည့်ပြီး edit data process ကို စပြီး အကောင်အထည်ဖော်ရေးသားလို့ရပါပြီ။ jTable ထဲက id field ထဲက value ကို row နဲ့ col တို့ရဲ့ position ကို မူတည်ပြီး getValueAt(row,col) method နဲ့ field id value ကို ရယူပါလိုက်ပါတယ်။အဲဒီနောက် id value ကို UserEditPage inner class ထဲကို pass လုပ်ပြီး data updating process ကို ရေးရပါမယ်။

```
int row=jTable1.getSelectedRow();
int col=0;
int selected_id=(int) jTable1.getValueAt(row, col);
```

Deleting Process

```
//////////////////////////////////////////////////////////////////////
popup.add(deleteMenu);
deleteMenu.addActionListener(new ActionListener(){
        @Override
        public void actionPerformed(ActionEvent e) {
            //Deleting process
       }
});
```

Edting process နဲ့ အတူတူပါပဲ။

jTable ထဲက id field ထဲက value ကို row နဲ့ col တို့ရဲ့ position ကို မူတည်ပြီး getValueAt(row,col) method နဲ့ field id value ကို ရယူပါလိုက်ပါတယ်။အဲဒီနောက် id value ကို DeleteEditPage inner class ထဲကို pass လုပ်ပြီး data deleting process ကို ရေးရပါမယ်။

```
//////////////////////////////////////////////////////////////////
```

UserIndexPage.java

```
////////////////////////////////////////////////////////////////////////
//import libraries
import java.awt.Color;
import java.awt.Font;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import javax.swing.table.DefaultTableModel;
import java.sql.*;
import java.sql.Statement;
import java.sql.ResultSet;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JMenuItem;
import javax.swing.JOptionPane;
import javax.swing.JPopupMenu;
import javax.swing.JTable;
import javax.swing.JTextField;

////////////////////////////////////////////////////////////////////////

//Declaration of Popup menu
  //Popup menu
    public JPopupMenu popup=new JPopupMenu();
    public  JMenuItem editMenu=new JMenuItem("Edit User ");
    public JMenuItem deleteMenu=new JMenuItem("Delete User");

////////////////////////////////////////////////////////////////////////

//implementation of edit popup menu
   popup.add(editMenu);
   editMenu.addActionListener(new ActionListener(){
    @Override
   public void actionPerformed(ActionEvent e) {

         int selectedId=getSelectedId(jTable1);
               if(selectedId==-1){
```

```
                return;
            }
            new UserEditPage(selectedId);

        }
    });

////////////////////////////////////////////////////////////////////////
//implementation of delete menu
        popup.add(deleteMenu);
        deleteMenu.addActionListener(new ActionListener(){
            @Override
            public void actionPerformed(ActionEvent e) {

                int selectedId=getSelectedId(jTable1);
                if(selectedId==-1){
                    return;
                }
                new UserDeletePage(selectedId);


            }
        });

////////////////////////////////////////////////////////////////
```

UserEditPage.class

```
//UserEditPage Implementation
class UserEditPage extends JFrame{

   String edit_name="";
   String edit_address="";

   public UserEditPage(int selectedId){


      //Data Retrieval using selected id
      try{
```

```
Database  db=new Database();
Connection conn=db.getConnected();

String sql="SELECT * from users where id="+selectedId;
Statement stmt=conn.createStatement();
ResultSet rs=stmt.executeQuery(sql);
 while(rs.next()){
     edit_name=rs.getString("name");
     edit_address=rs.getString("address");

 }

}
catch(Exception  e1){
   e1.printStackTrace();
}



/* Create Popup Dialog JFrame */

JFrame editWindow=new JFrame("Edit Categoy");
editWindow.setLayout(null);


JLabel title=new JLabel("Edit Category");
title.setFont(new Font("times",Font.BOLD,20));
title.setBounds(50,50,300,30);
editWindow.add(title);

JButton closeBtn=new JButton("[X]Close");
closeBtn.setBackground(Color.red);
closeBtn.setForeground(Color.white);
closeBtn.setBounds(350,50,100,30);
editWindow.add(closeBtn);
closeBtn.addActionListener(new ActionListener(){
        @Override
        public void actionPerformed(ActionEvent e) {
            editWindow.setVisible(false);
        }
});

JLabel name_lb=new JLabel("User Name");
name_lb.setBounds(50,150,200,30);
```

```
editWindow.add(name_lb);

JTextField name_tf=new JTextField(edit_name);
name_tf.setBounds(250,150,200,30);
editWindow.add(name_tf);

JLabel address_lb=new JLabel("User Address");
address_lb.setBounds(50,200,200,30);
editWindow.add(address_lb);

JTextField address_tf=new JTextField(edit_address);
address_tf.setBounds(250,200,200,30);
editWindow.add(address_tf);

JButton updateBtn=new JButton("Update");
updateBtn.setBounds(250,250,200,30);
editWindow.add(updateBtn);

updateBtn.addActionListener(new ActionListener(){
    @Override
    public void actionPerformed(ActionEvent e) {
       try{

          Database  db=new Database();
          Connection conn=db.getConnected();

          String sql="UPDATE users set name=?, address=? WHERE id=?";
          PreparedStatement pst=conn.prepareStatement(sql);
          pst.setString(1, name_tf.getText());
          pst.setString(2, address_tf.getText());
          pst.setInt(3, selectedId);
          pst.execute();

          JOptionPane.showMessageDialog(null, "Update Success...");

          editWindow.dispose();
          dispose();
          UserIndexPage userIndexPage=new UserIndexPage();
          userIndexPage.setVisible(true);

       }
       catch(Exception  e2){
          e2.printStackTrace();
       }
```

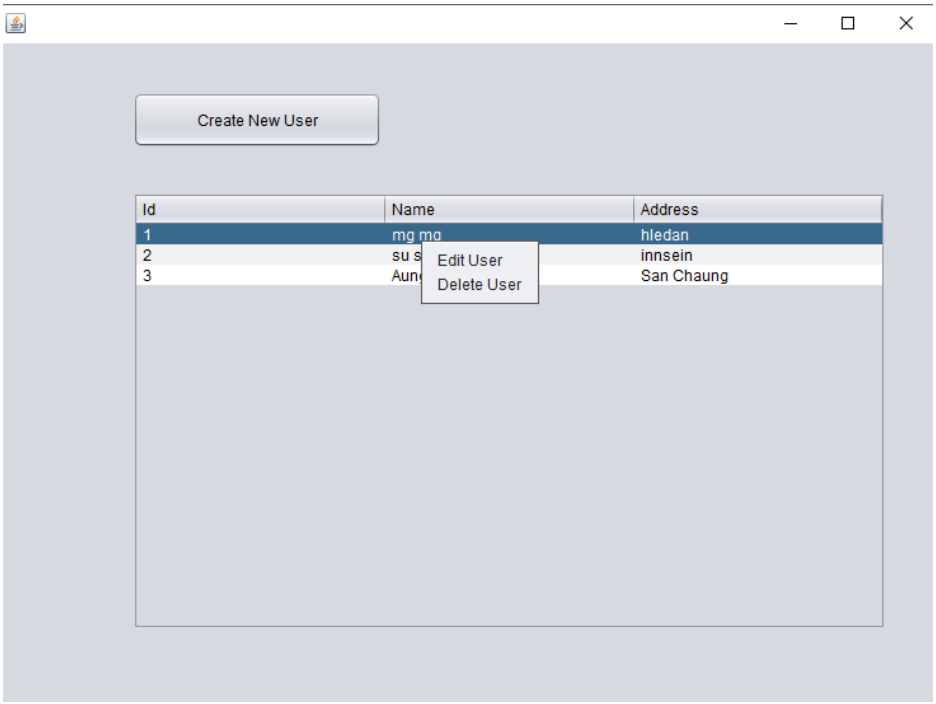
```
            }


            });


            editWindow.setDefaultCloseOperation(EXIT_ON_CLOSE);
            editWindow.setSize(600,400);
            editWindow.setLocationRelativeTo(null);
            editWindow.setVisible(true);



    }
}
```

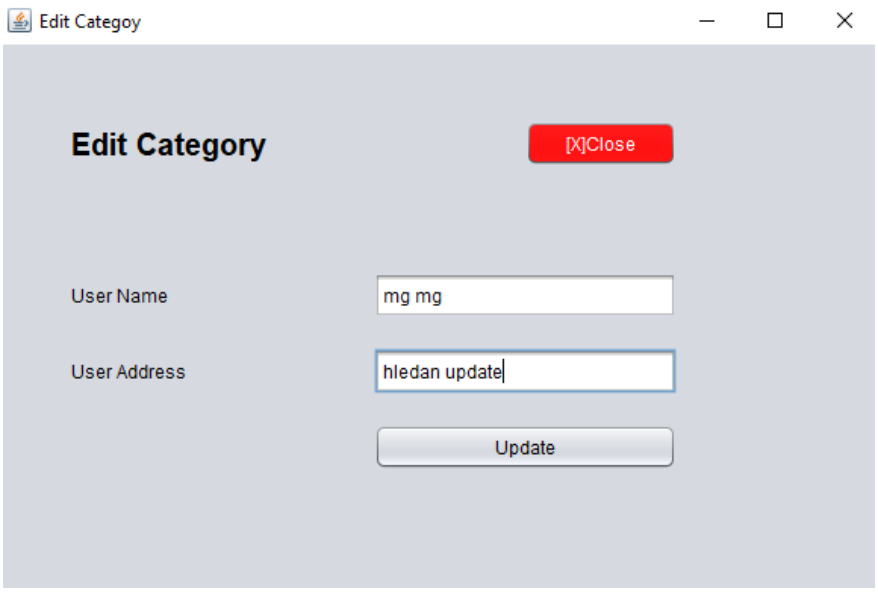
UserDeletePage.class

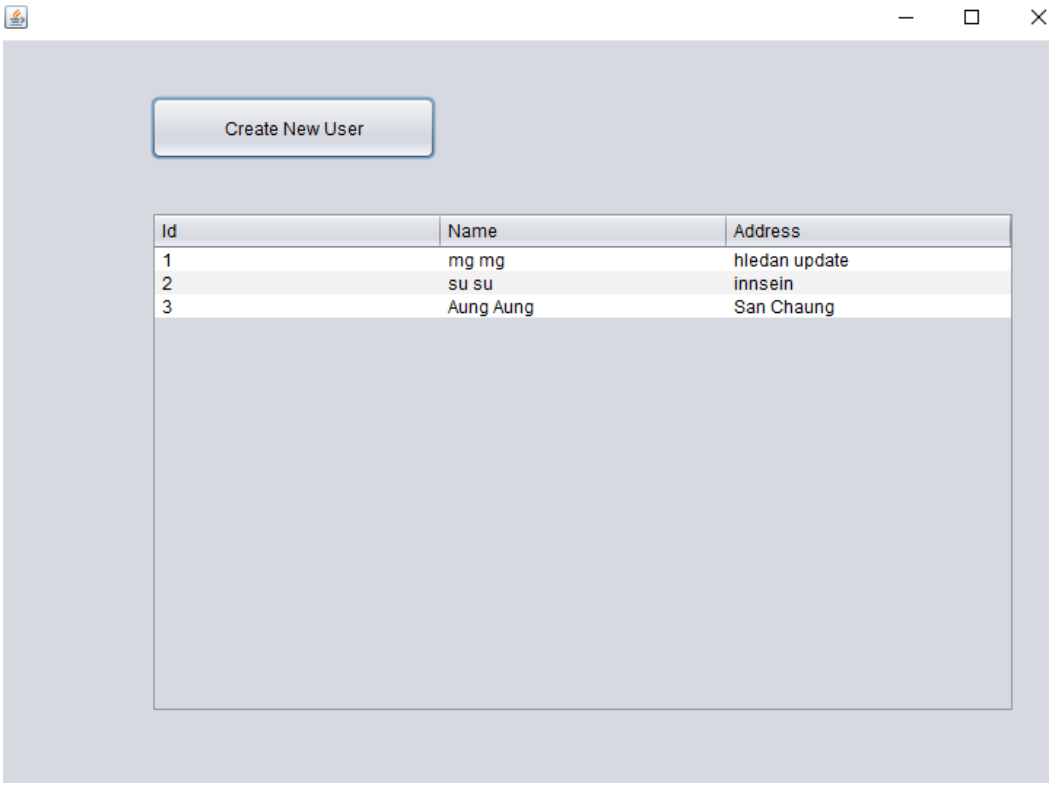
```
//delete user implementation
class UserDeletePage extends JFrame {
    public UserDeletePage(int selectedId){
        try{

            Database db=new Database();
            Connection conn=db.getConnected();

            String sql="DELETE from users WHERE id="+selectedId;

            Statement stmt=conn.createStatement();
            stmt.execute(sql);

            JOptionPane.showMessageDialog(null, "Successfully Deleted...");

            this.dispose();
            UserIndexPage userIndexPage=new UserIndexPage();
            userIndexPage.setVisible(true);
```

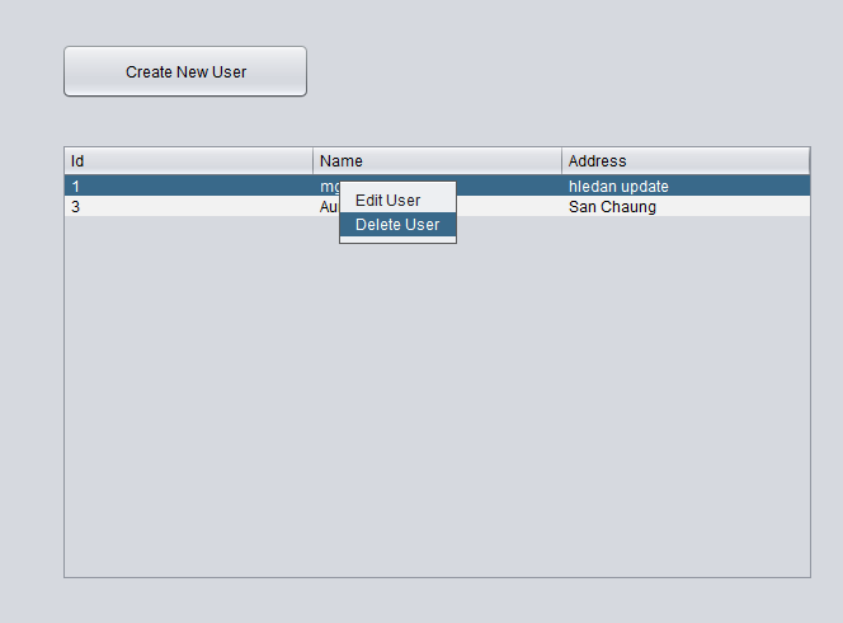
```
        }
        catch(Exception e){
           e.printStackTrace();
        }


    }
}
```

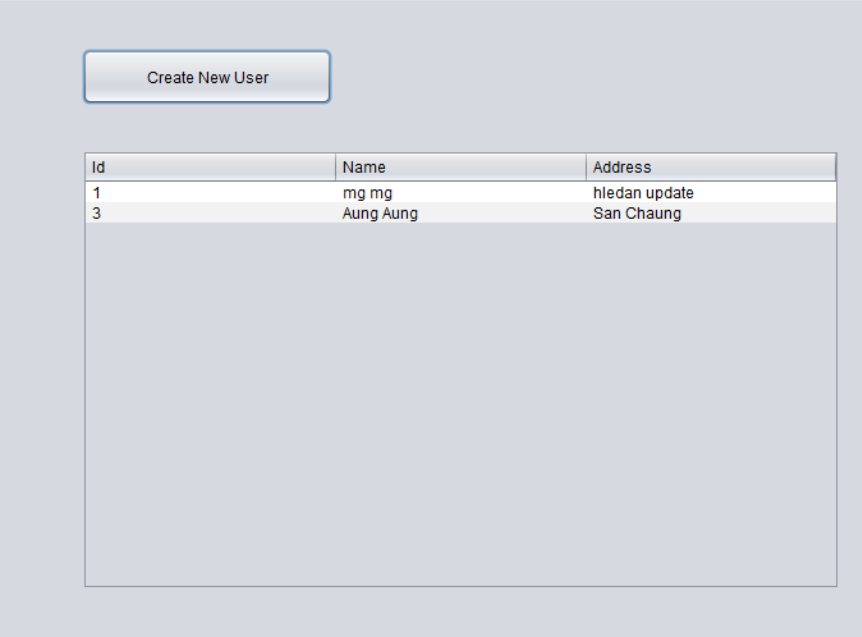
Output:




Edit Categoy
Edit Category
[X]Close
User Name
mg mg
User Address
hledan update
Update


Create New User
Id
Name
Address
1
mg mg
hledan update
2
su su
innsein
3
Aung Aung
San Chaung


Create New User
Id
Name
Address
1
mg
hledan update
3
Au
San Chaung
Edit User
Delete User


Create New User
Id
Name
Address
1
mg mg
hledan update
3
Aung Aung
San Chaung

Assignment 1

- Category CRUD
  Category (id, name)

- Items CRUD
  Item(id,category,name,price)

Project file ကို zip လုပ်ပြီး northerncitycenter@gmail.com သို့ ပို့ရန်

Code Correction နဲ့ instructor comments ရေးပြီး ပြန်ပို့ပေးပါမည်။