

# Java tools for beginners

Сергей Немчинский, FoxmindEd,  
2019

Что такое

# Базы данных и какие они бывают?

# Концепция трех-тирового приложения



# Основные понятия

- ❑ Реляционные базы данных
- ❑ JDBC
- ❑ Drivers
- ❑ ORM (Object-relational mapping)

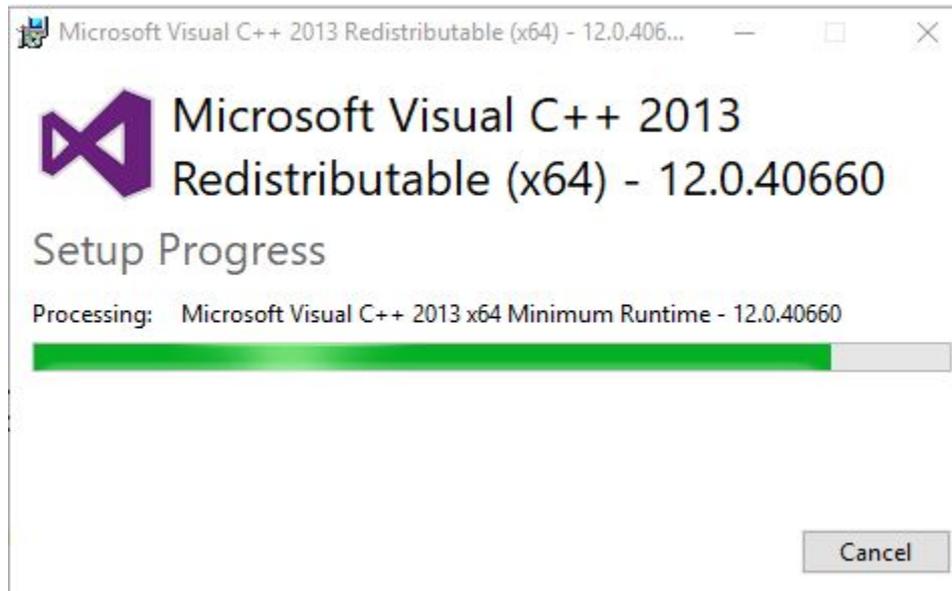
# Реляционные базы данных

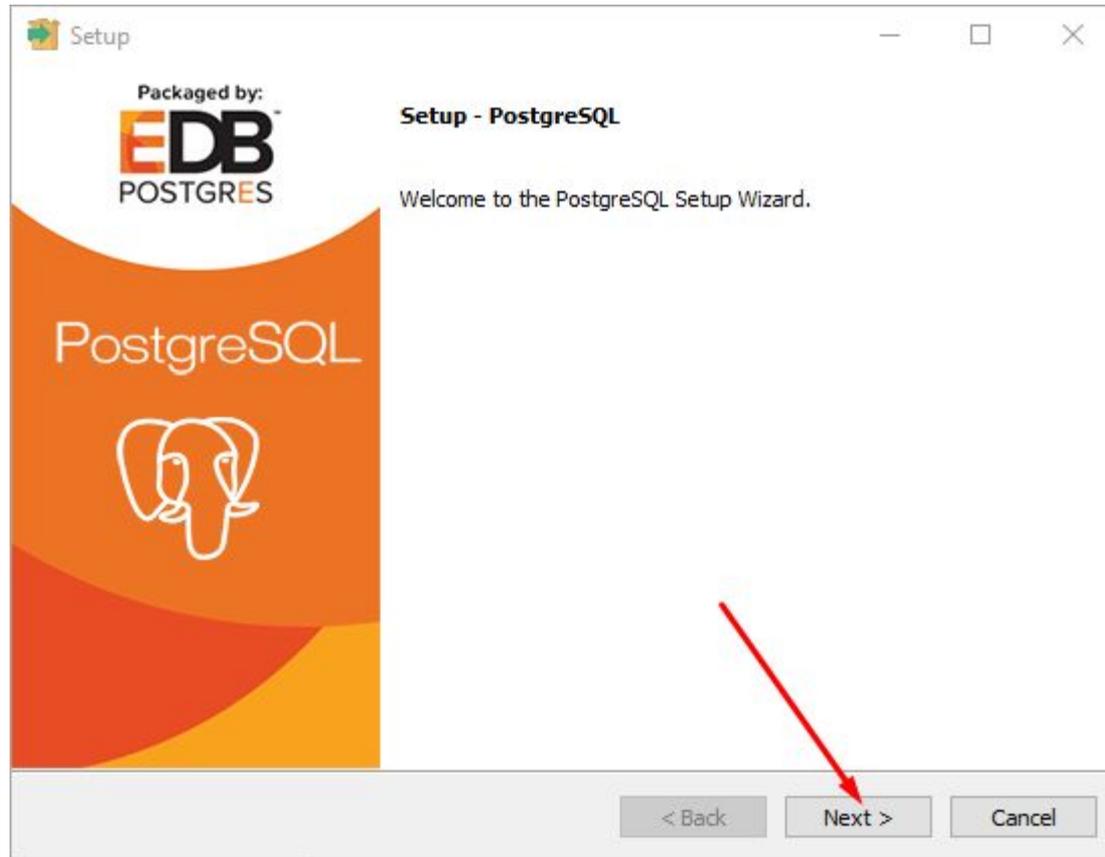
EMPLOYEE		
ID	NAME	DEPARTMENT_ID

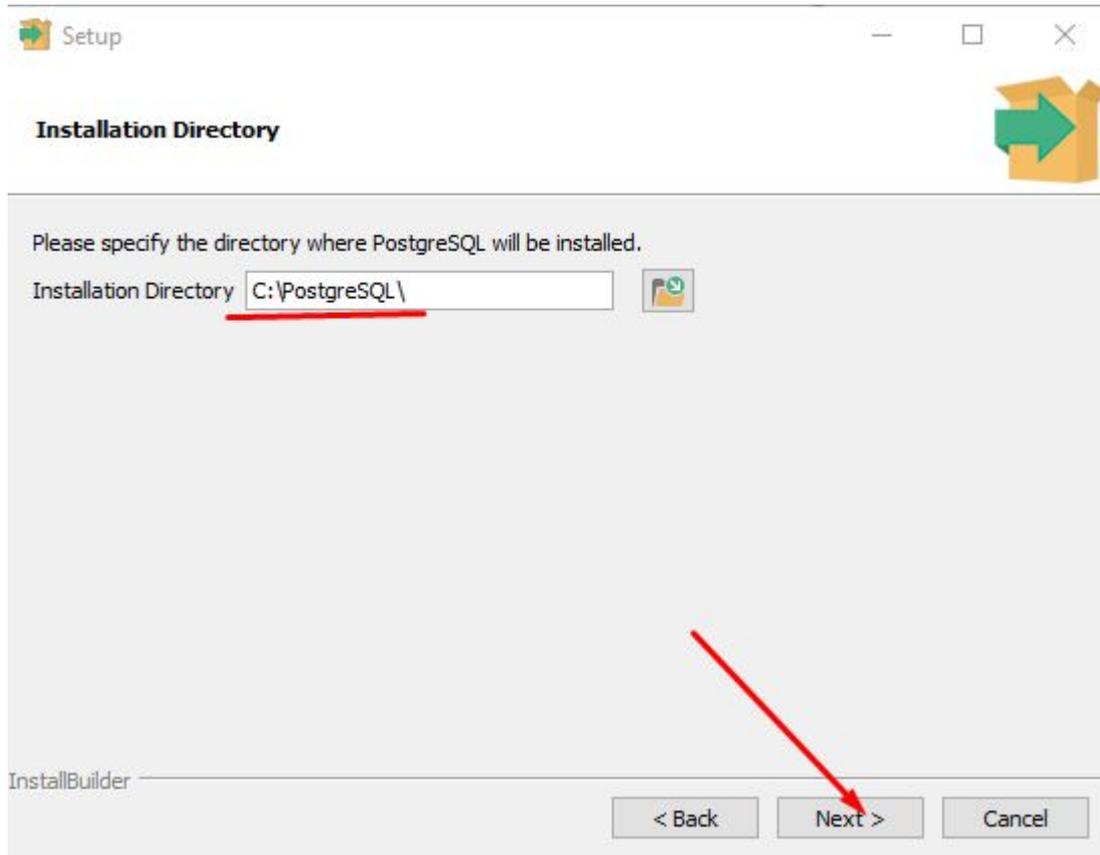
DEPARTMENTS		
ID	NAME	DESCR

Практика

# Устанавливаем PostgreSQL







Setup



### Select Components

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

- PostgreSQL Server
- pgAdmin 4
- Stack Builder
- Command Line Tools

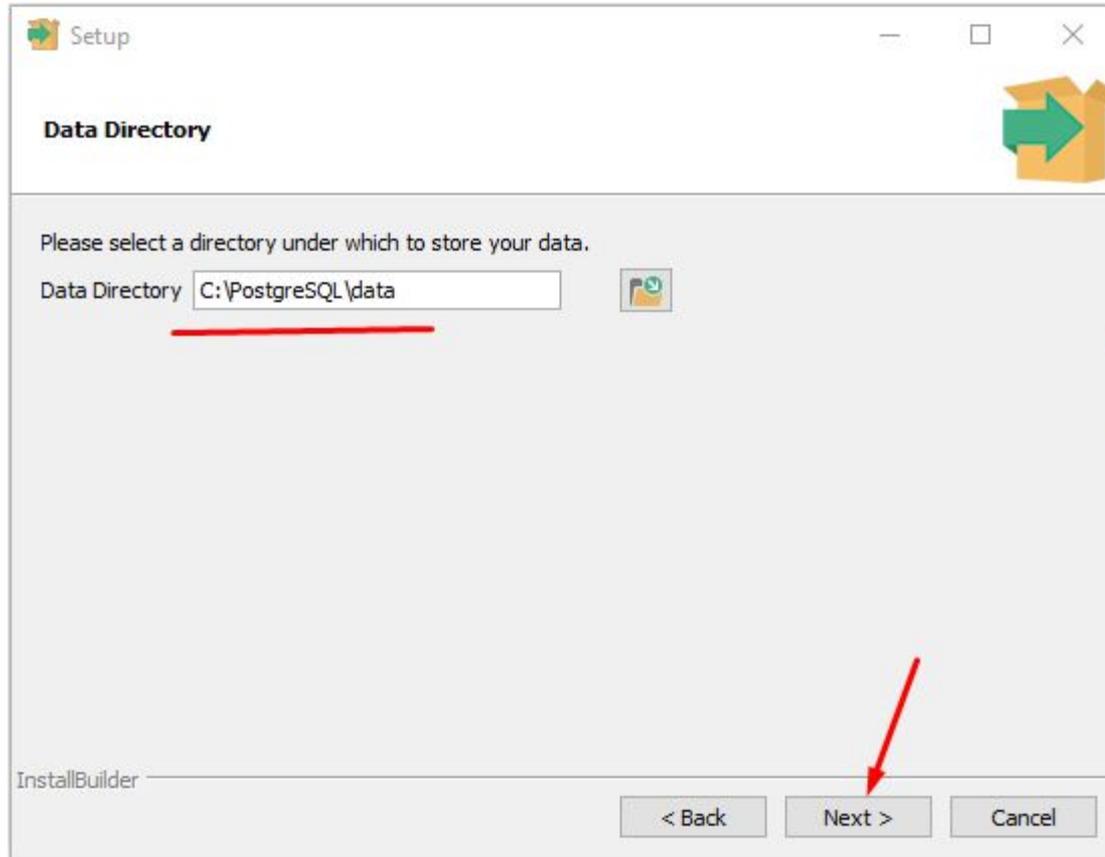
Click on a component to get a detailed description

InstallBuilder

< Back

Next >

Cancel



Setup

**Password**

Please provide a password for the database superuser (postgres).

Password

Retype password

InstallBuilder

< Back    Next >    Cancel

Setup

**Port**

Please select the port number the server should listen on.

Port

InstallBuilder

< Back    Next >    Cancel

Setup

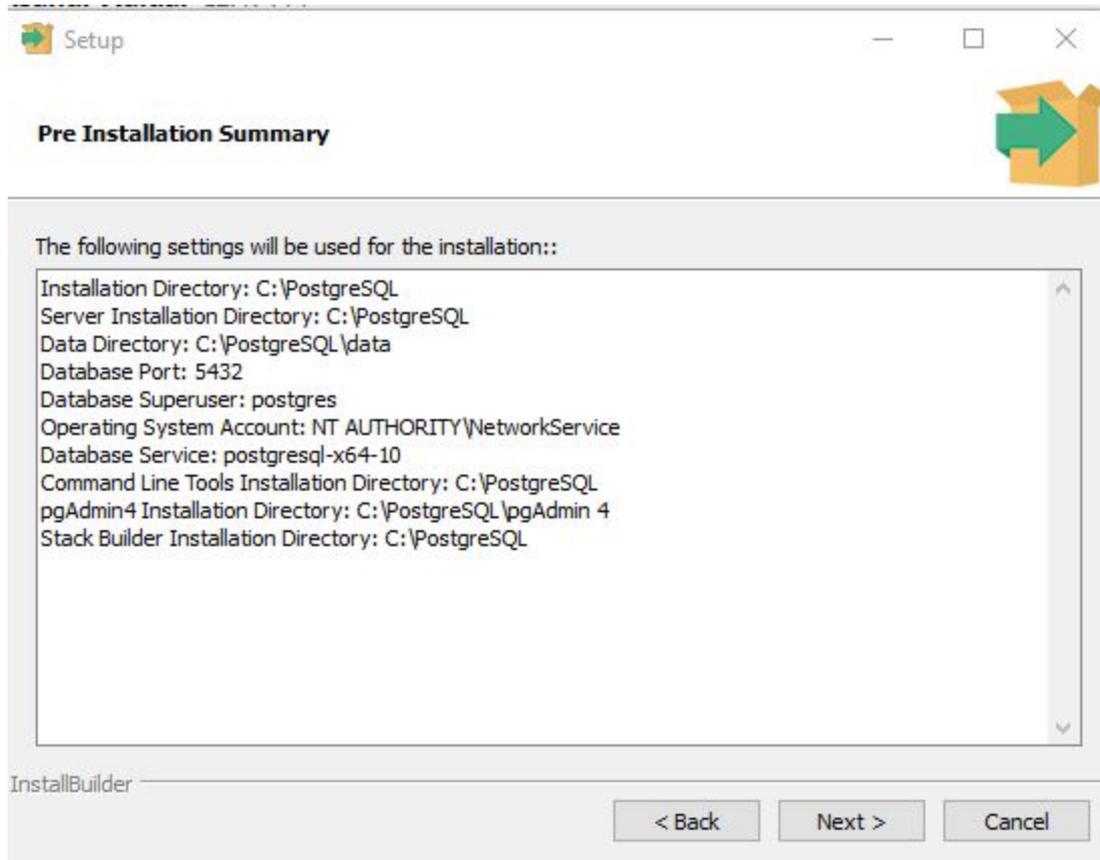
**Advanced Options**

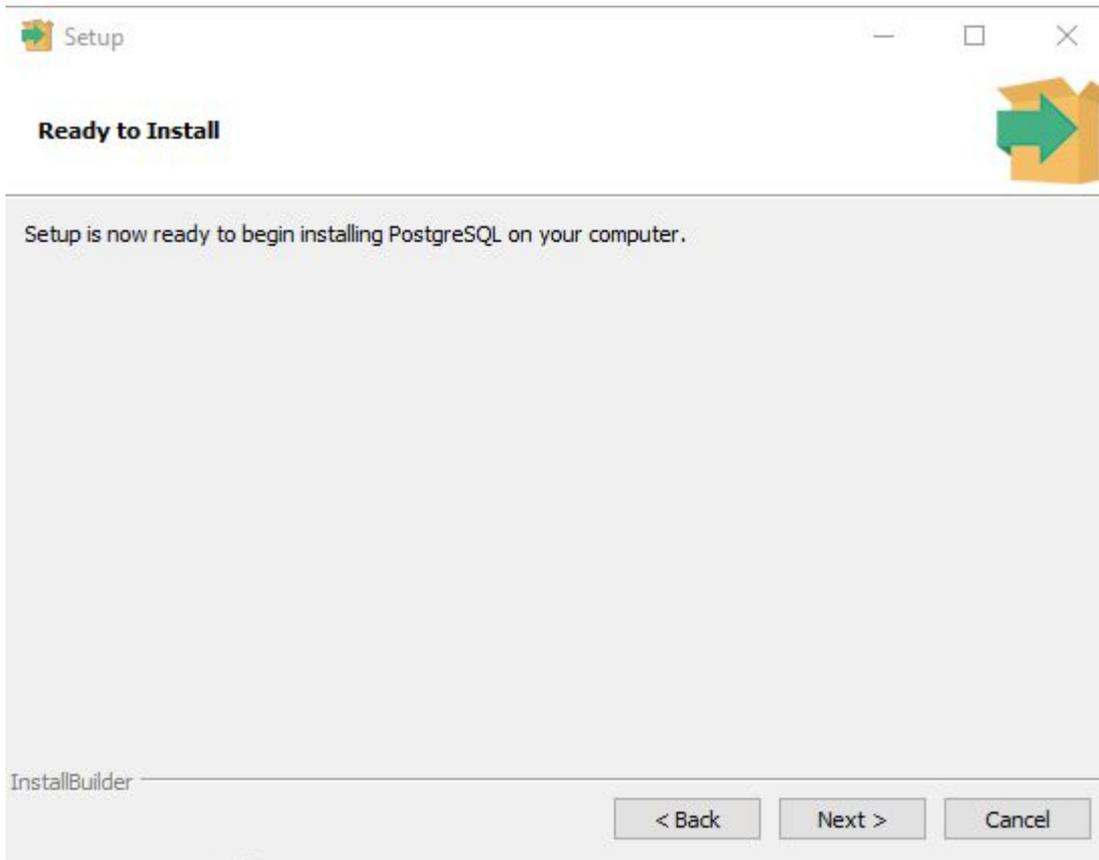
Select the locale to be used by the new database cluster.

Locale Ukrainian, Ukraine

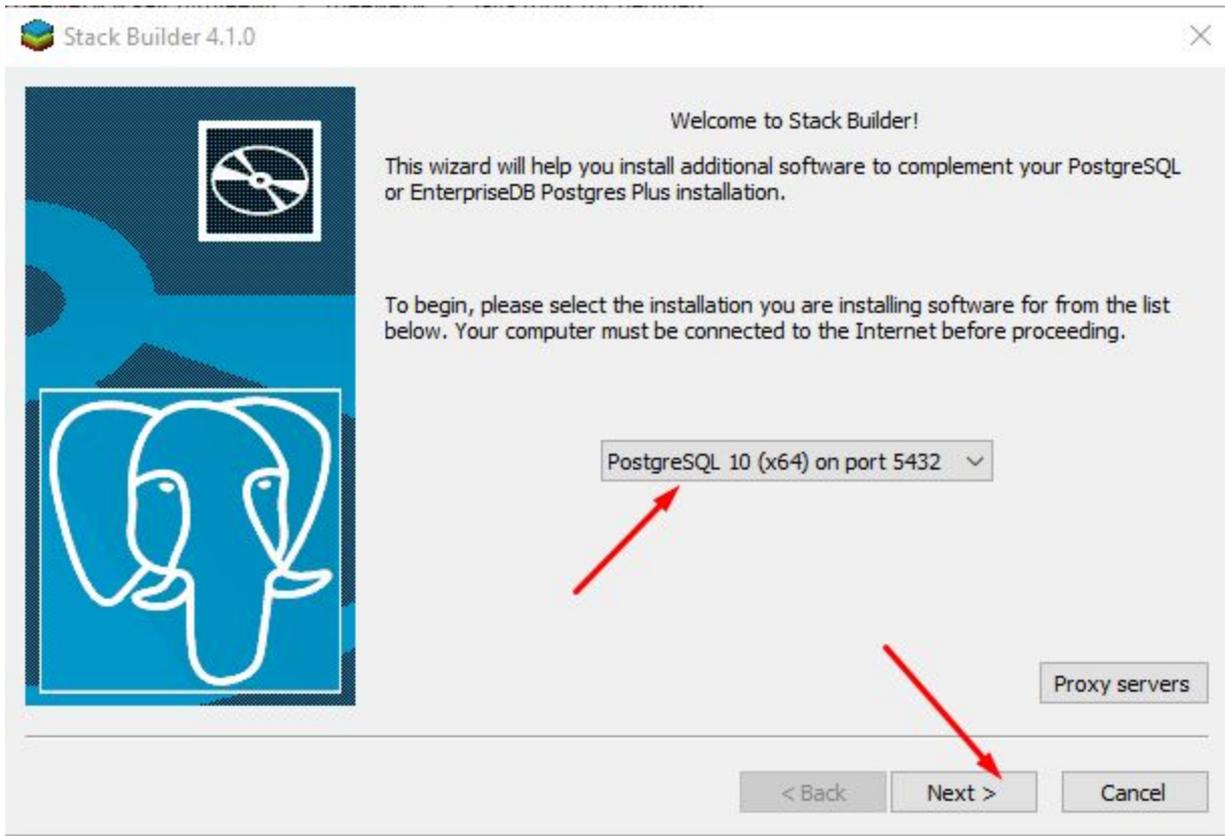
InstallBuilder

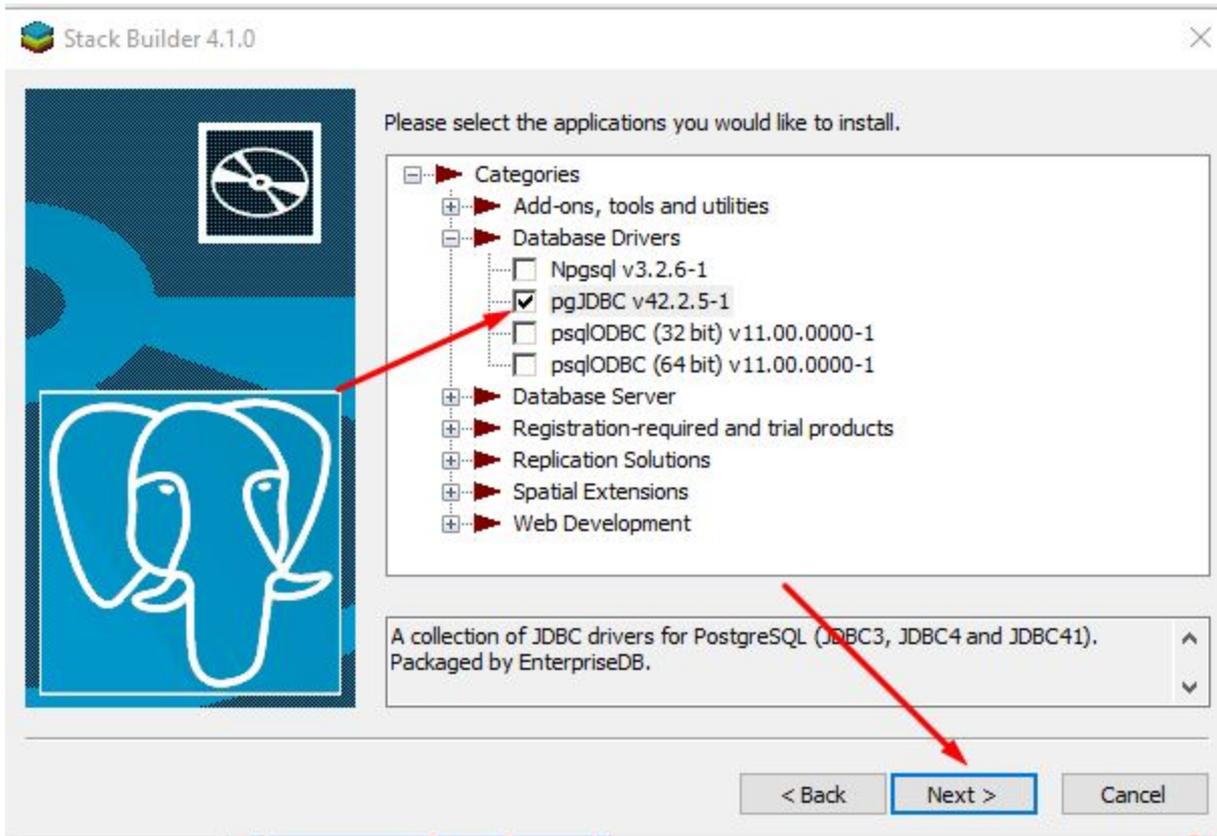
< Back   Next >   Cancel

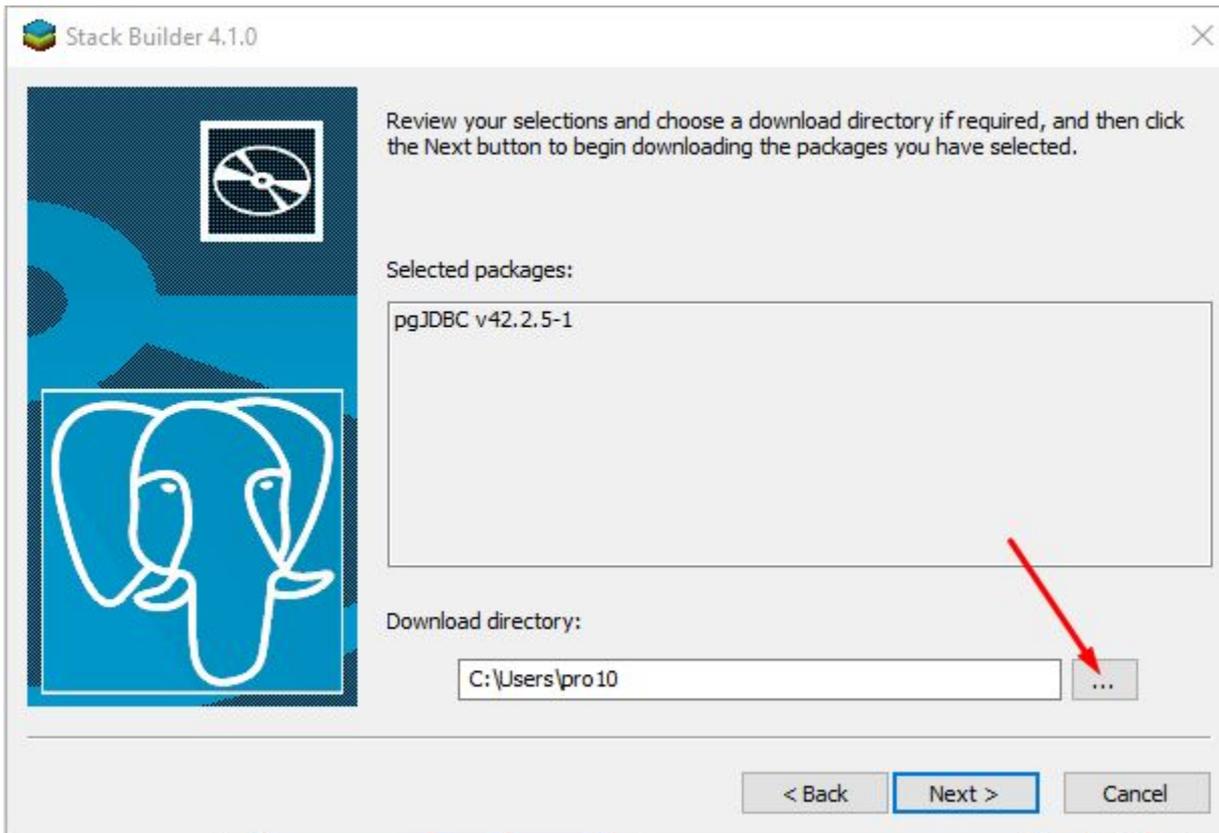


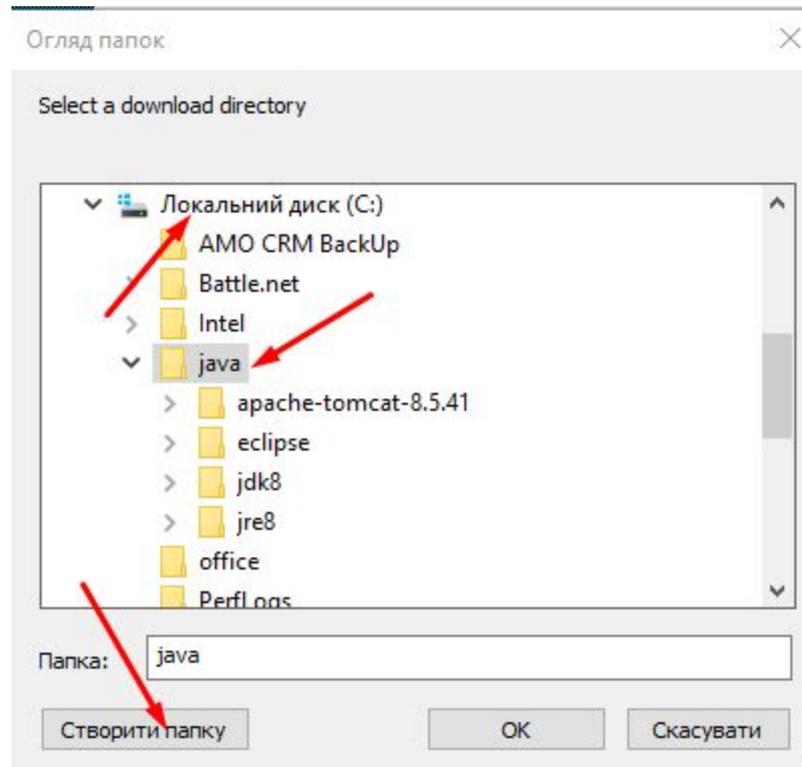


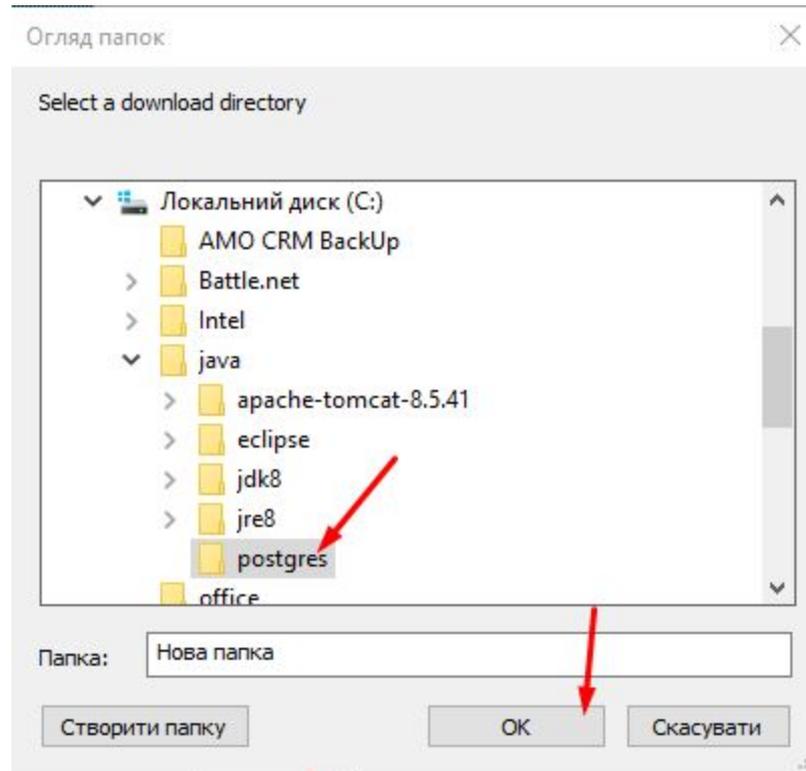


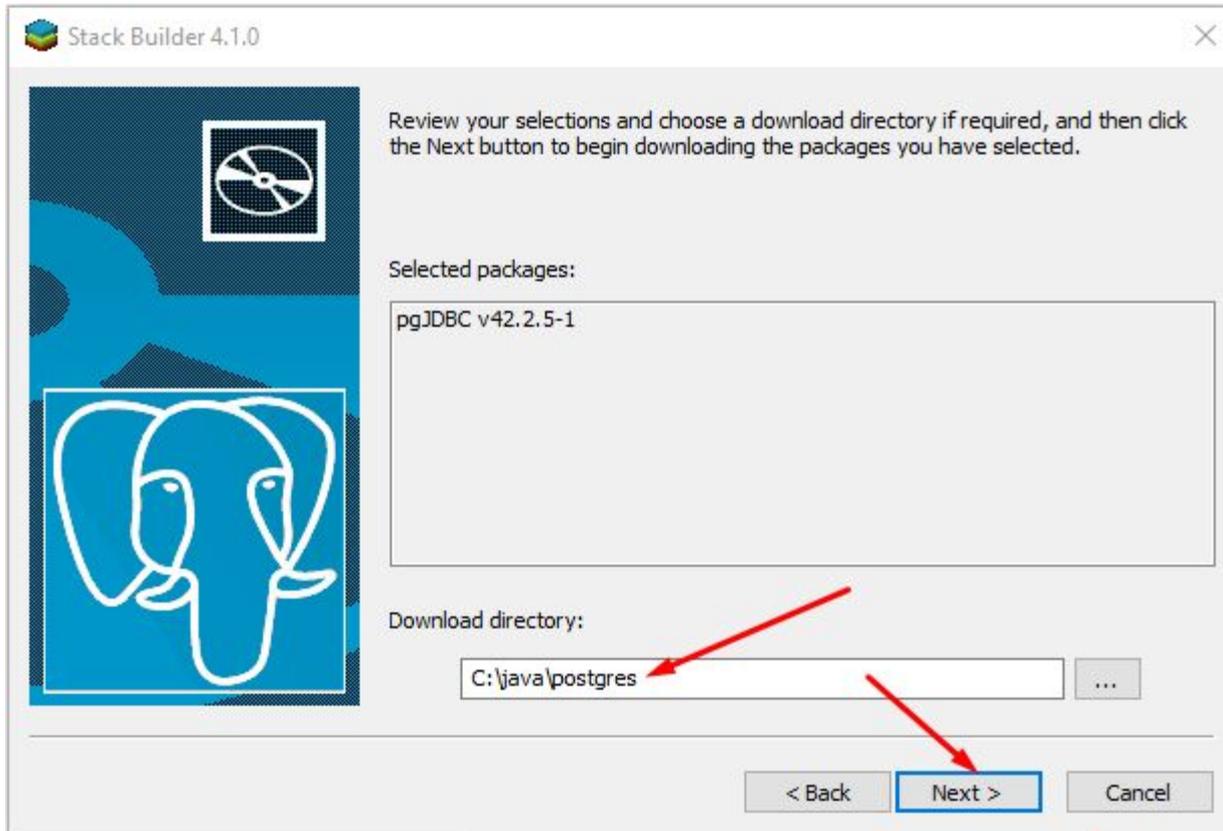












Stack Builder 4.1.0



All the installation files have now been successfully downloaded.

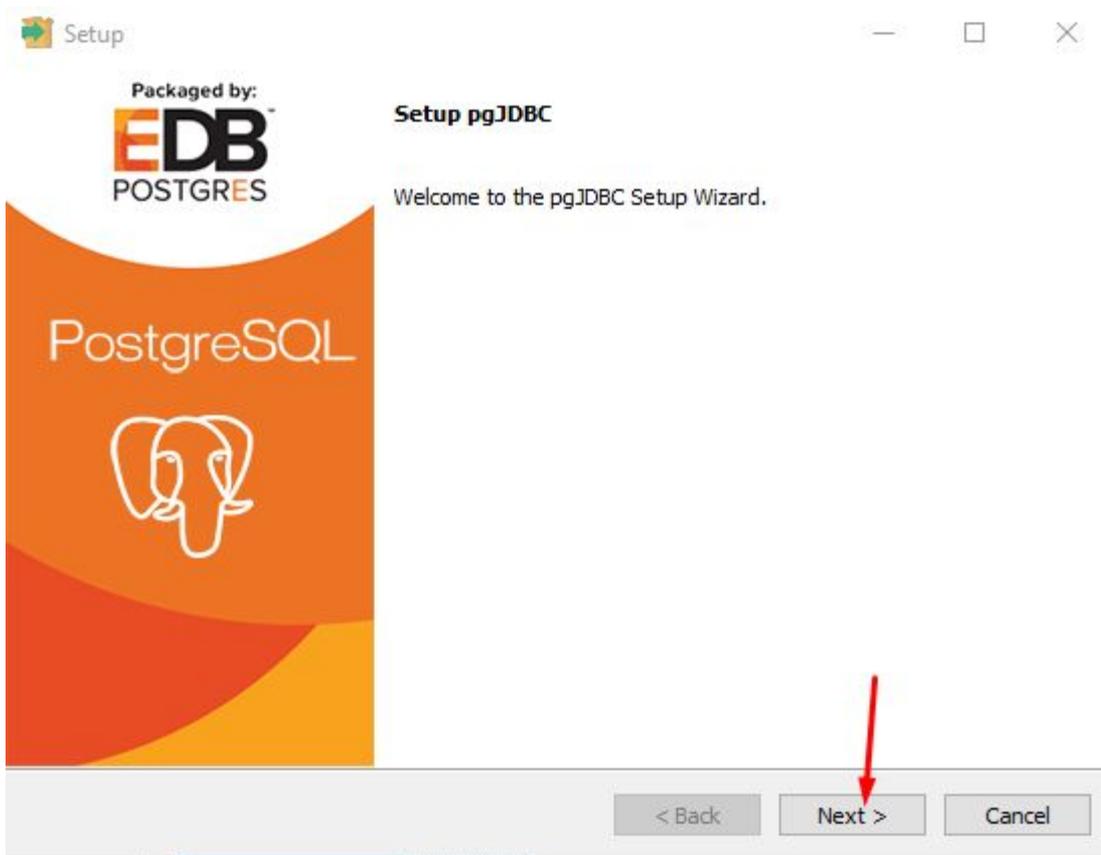
Please click the "Next" button to start the installations.

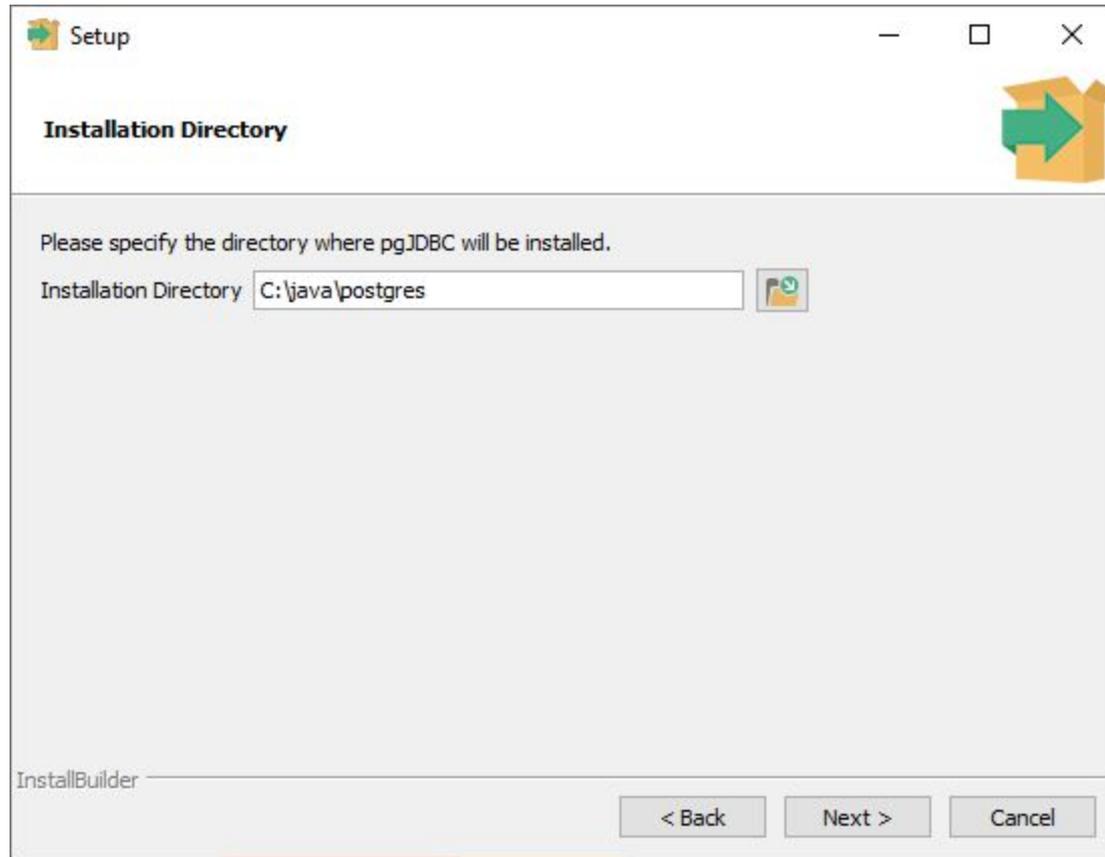
Note: You must allow all installations to run to completion. If you are prompted to restart the computer, click "No" or "Restart Later" and manually restart your computer when all the installation have finished.

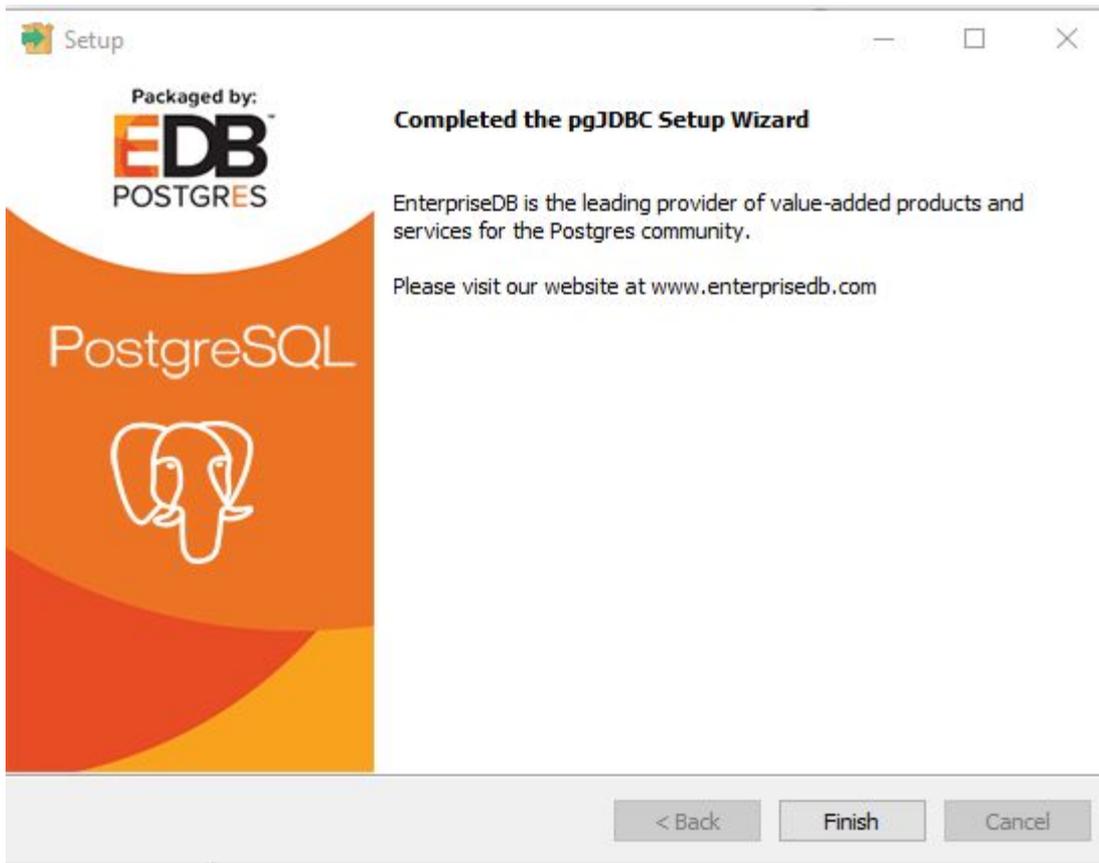
 Skip Installation

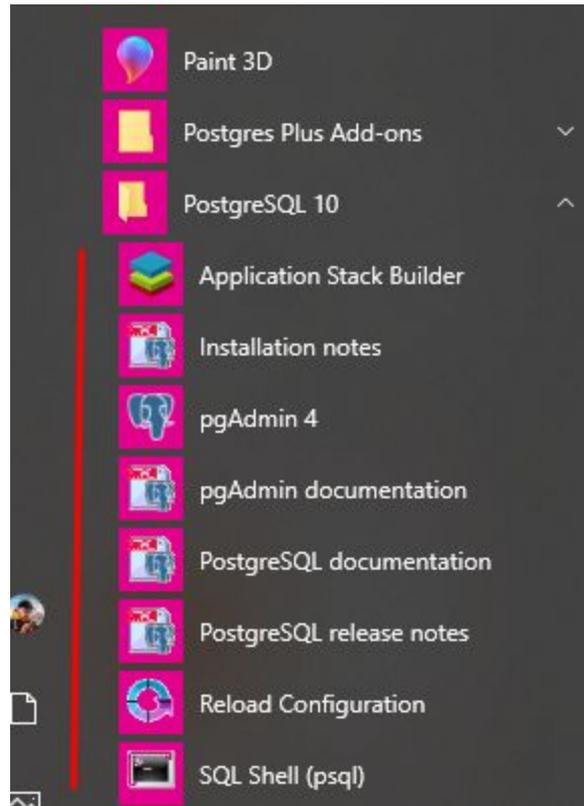
< Back   **Next >**   Cancel











Практика

# Изучаем pgAdmin



pgAdmin

Management Tools for PostgreSQL

Starting pgAdmin4 server...

Welcome



pgAdmin

Management Tools for PostgreSQL

Feature rich | Maximises PostgreSQL | Open Source

pgAdmin is an Open Source administration and management tool for the PostgreSQL database. It includes a graphical administration interface, an SQL query tool, a procedural code debugger and much more. The tool is designed to answer the needs of developers, DBAs and system administrators alike.

Quick Links



Add New Server



Configure pgAdmin

Getting Started



PostgreSQL Documentation



pgAdmin Website



Planet PostgreSQL



Community Support

### Connect to Server

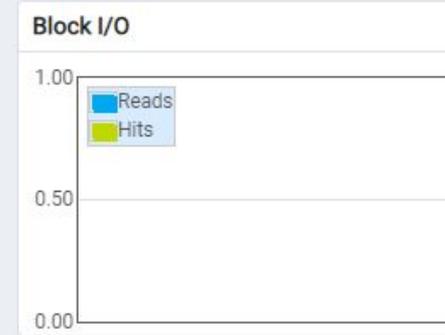
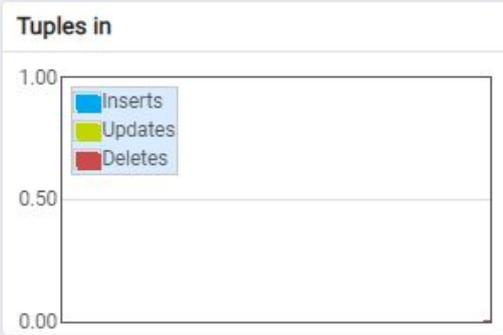
Please enter the password for the user 'postgres' to connect the server - "PostgreSQL 10"

Password

Save Password

✕ Cancel

✓ OK



### Server activity

Sessions Locks Prepared Transactions Configuration

		PID	Database	User	Application	Client	Backend start	State	Wait event
		▶	6080	postgres	postgres	pgAdmin 4 - DB:postgres	:::1	2019-05-20 15:45:57 EEST	active

- Servers (1)
  - PostgreSQL 10
    - Databases (1)
      - postgres
        - Casts
        - Catalogs
        - Event Triggers
        - Extensions
        - Foreign Data Wrapper
        - Languages
        - Schemas
      - Login/Group Roles
      - Tablespaces

### Database sessions



### Transactions per second



### Tuples in



### Tuples out



### Server activity

Sessions Locks Prepared Transactions

			PID	User	Application	Client	Backend start
✖	■	▶	6080	postgres	pgAdmin 4 - DB:postgres	:::1	2019-05-20 15:45:57 EEST

- > Casts
- > Catalogs
- > Event Triggers
- > Extensions
- > Foreign Data Wrapper
- > Languages
- > Schemas
- > Login/Group Roles
- > Tablespaces

1

Empty area for query results or messages.

Практика

# Создаем в базе первоначальные таблицы

The screenshot shows a database management interface. On the left, a tree view displays the hierarchy: Servers (1) > PostgreSQL 10 > Databases (1) > postgres > Schemas (1). The 'Schemas (1)' folder is selected and highlighted in light blue. A context menu is open over this folder, showing options: 'Create' (with a right-pointing arrow), 'Schema...', and 'Refresh...'. A red arrow points to the 'Create' option, and another red arrow points to the 'Schema...' option. The main pane on the right shows a SQL editor with the text: `1 -- No SQL could be generated for the selected obj`.

The screenshot shows a database management interface. On the left, a tree view displays the hierarchy: Servers (1) > PostgreSQL 10 > Databases (1) > postgres > Schemas (1) > public. The 'public' schema is selected and highlighted in light blue. A context menu is open over the 'public' schema, with the 'Create' option selected, which has opened a sub-menu containing 'Schema...'. A 'Refresh...' option is also visible in the main context menu. On the right, a SQL editor shows a single line of text: `1 -- No SQL could be generated for the selected obj`. Red arrows point to the 'postgres' database, the 'public' schema, the 'Create' menu item, and the 'Schema...' sub-menu item.

**Create - Schema** ✕

General Security Default privileges SQL

Name

Owner

Comment

**i** **?** ✕ Cancel 🔄 Reset 💾 Save

The image shows a tree view of a database structure. The 'Schemas (2)' folder is expanded to show the 'books' schema. The 'Tables' item under 'books' is selected and highlighted in light blue. A context menu is open over the 'Tables' item, with the 'Create' option selected, which has opened a sub-menu where 'Table...' is highlighted. Red arrows point to the 'books' schema, the 'Tables' item, the 'Create' option, and the 'Table...' option.

- > Languages
- ▼ Schemas (2)
  - ▼ books
    - > Collations
    - > Domains
    - > FTS Configurations
    - > FTS Dictionaries
    - > FTS Parsers
    - > FTS Templates
    - > Foreign Tables
    - > Functions
    - > Materialized Views
    - > Sequences
    - Tables
    - > Trigger Fun
    - > Types
    - > Views
  - > public
- ▼ Login/Group Roles (6)
  - pg\_monitor
  - pg\_read\_all\_settings
  - pg\_read\_all\_stats

Context Menu:

- Create > Table...
- Refresh...
- Grant Wizard...

**Create - Table** ✕

General Columns Constraints Advanced Partition Parameters Security SQL

Name

Owner

Schema

Tablespace

Partitioned table?

Comment

Create - Table postgres/postgr...

General **Columns** Constraints Advanced Partition Parameters Security SQL

Inherited from table(s)

Columns +

Name	Data type	Length	Precision	Not NULL?	Primary key?	<small>Add new row</small>
------	-----------	--------	-----------	-----------	--------------	----------------------------

i ? Cancel Reset Save

## Create - Table



General **Columns** Constraints Advanced Partition Parameters Security SQL

Inherited from table(s)

### Columns



	Name	Data type	Length	Precision	Not NULL?	Primary key?
 	id	<input type="text" value="integer"/>			<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
 	name	<input type="text" value="character"/>	250		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No



Cancel

Reset

Save

- ▼ Schemas (2)
  - ▼ books
    - > Collations
    - > Domains
    - > FTS Configurations
    - > FTS Dictionaries
    - > FTS Parsers
    - > FTS Templates
    - > Foreign Tables
    - > Functions
    - > Materialized Views
    - > Sequences
    - ▼ Tables (1)
      - ▼ BOOKS
        - > Columns (2)
        - > Constraints (1)
        - Indexes
        - > Rules
        - > Triggers
      - > Trigger Functions



- > Catalogs
- > Event Triggers
- > Extensions
- > Foreign Data Wrappers
- > Languages
- ▼ Schemas (2)
  - ▼ books
    - > Collations
    - > Domains
    - > FTS Configurations
    - > FTS Dictionaries
    - > FTS Parsers
    - > FTS Templates
    - > Foreign Tables
    - > Functions
    - > Materialized Views
    - > Sequences
    - ▼ Tables (1)
      - ▼ BOOKS
        - > Columns (2)
        - > Constraints (1)
        - Indexes
        - > Rules
        - > Triggers

```
1 -- Table: books."BOOKS"  
2  
3 -- DROP TABLE books."BOOKS";  
4  
5 CREATE TABLE books."BOOKS"  
6 (  
7     id integer NOT NULL,  
8     name character(250) COLLATE pg_catalog."default" NOT NULL,  
9     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)  
10 )  
11 WITH (  
12     OIDS = FALSE  
13 )  
14 TABLESPACE pg_default;  
15  
16 ALTER TABLE books."BOOKS"  
17     OWNER to postgres;
```

workspace - SimpleWeb/WebContent/index.jsp - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- HelloWorld
- reverse
- Servers
- SimpleWeb

index.jsp

```
1 <%@ page language="java" contentType="text/html; charset=ISO-8859-1" %>
2   pageEncoding="ISO-8859-1"%>
3 <!DOCTYPE html>
4 <html>
5 <head>
6 <meta charset="ISO-8859-1">
7 <title>Insert title here</title>
8 </head>
9 <body>
10   <h1>Hello World</h1>
11
12 </body>
13 </html>
```

Quick Access

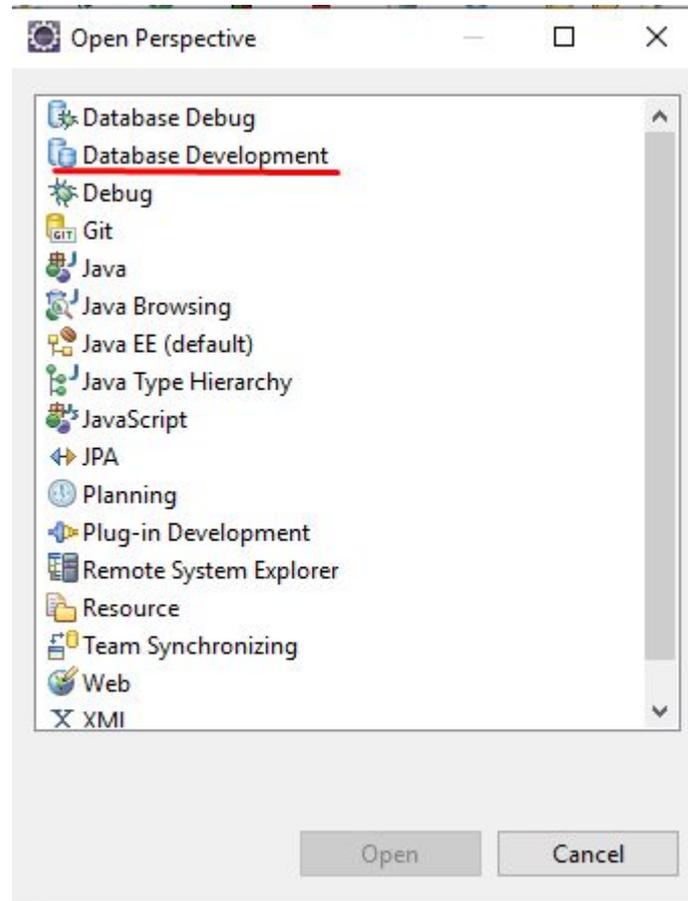
Open Perspective

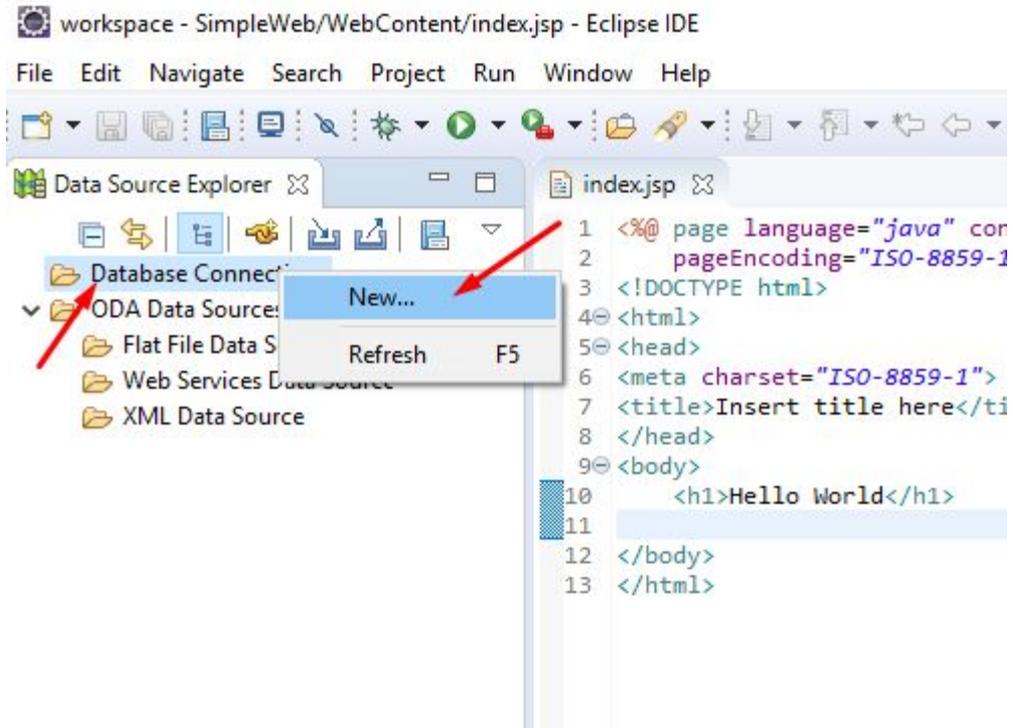
Outline

- jsp directive.page language=java
- !DOCTYPE:html
- html
  - head
  - body

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v8.5 Server at localhost [Stopped]





### Connection Profile

Create a PostgreSQL connection profile.



#### Connection Profile Types:

- DB2 for i5/OS
- DB2 for z/OS
- Derby
- Generic JDBC
- HSQLDB
- Informix
- Ingres
- MaxDB
- MySQL
- Oracle
- PostgreSQL**
- SQL Server
- SQLite
- Subversion

Name:

Description (optional):



< Back

Next >

Finish

Cancel

New JDBC Connection Profile

### Specify a Driver and Connection Details

 Define and select a driver from the drop-down list to continue.

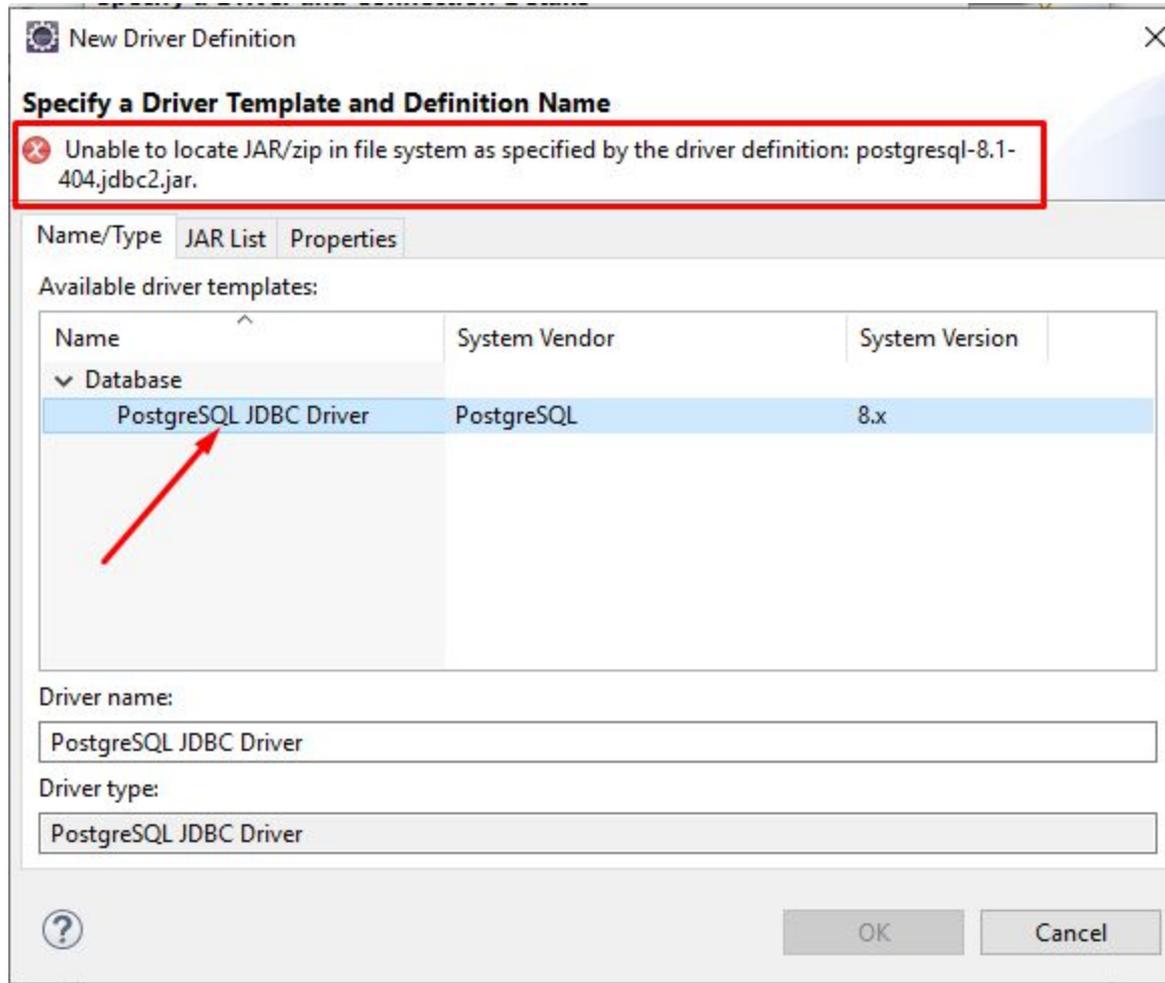
Drivers:    

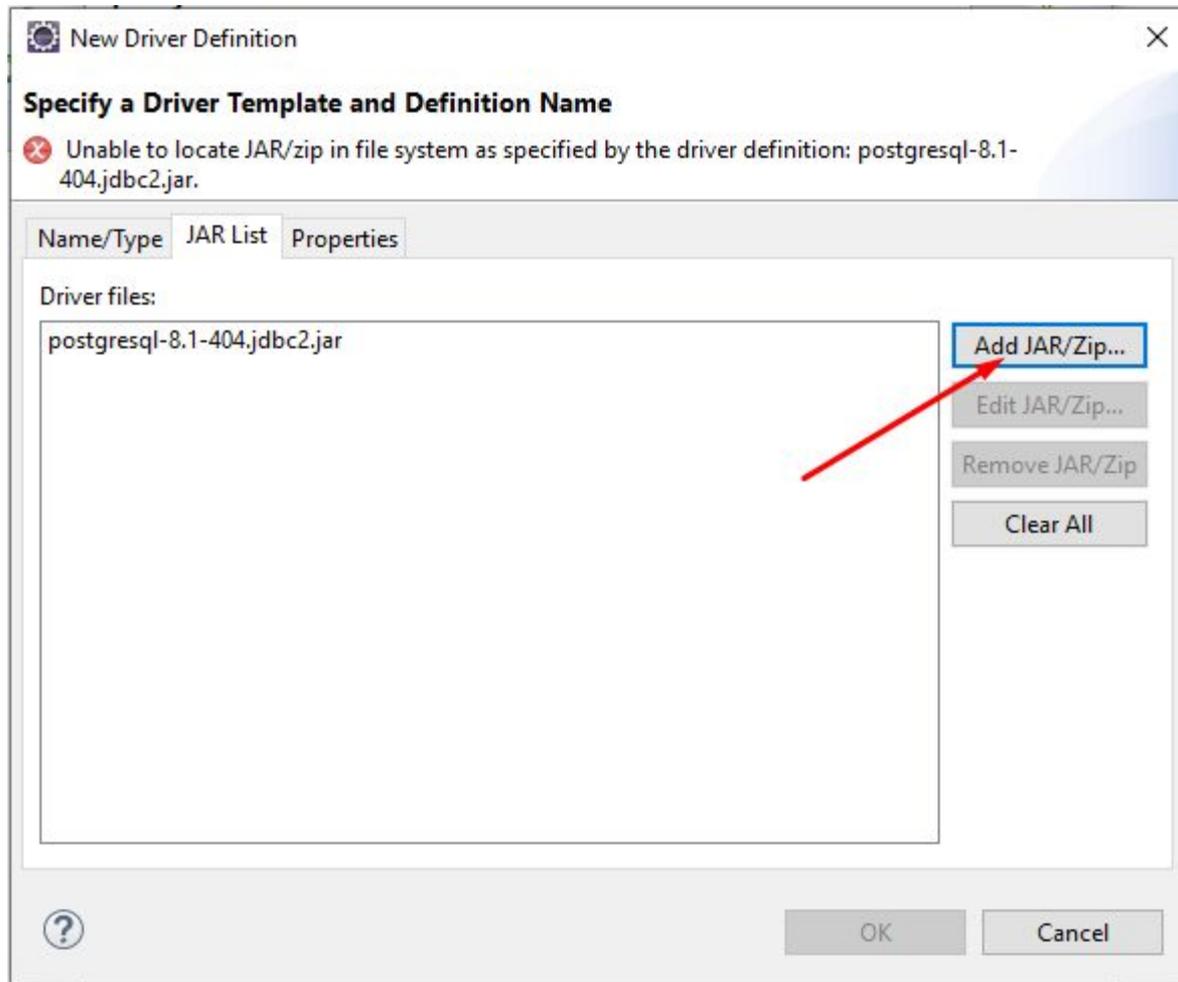
Properties

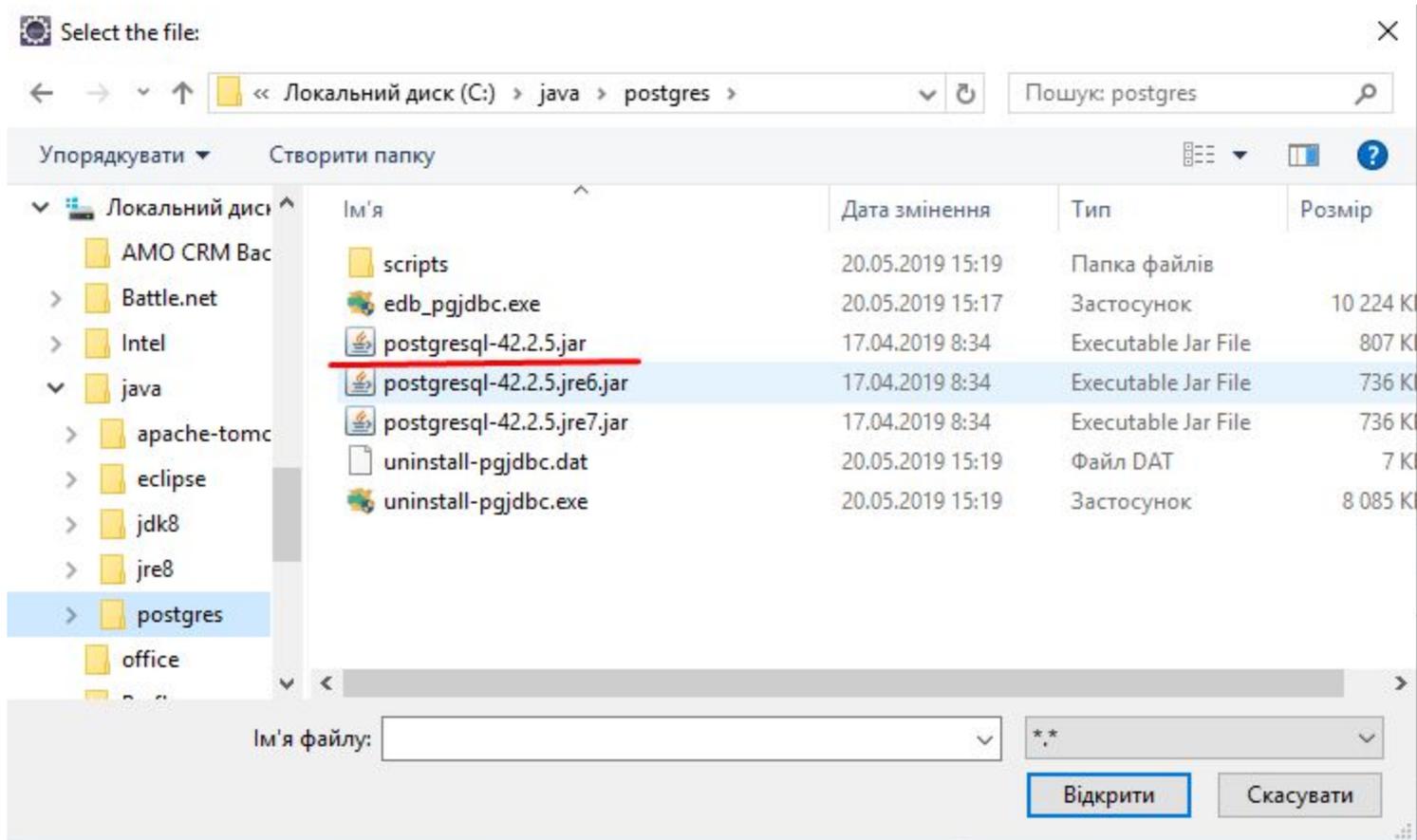
Connect when the wizard completes Test Connection

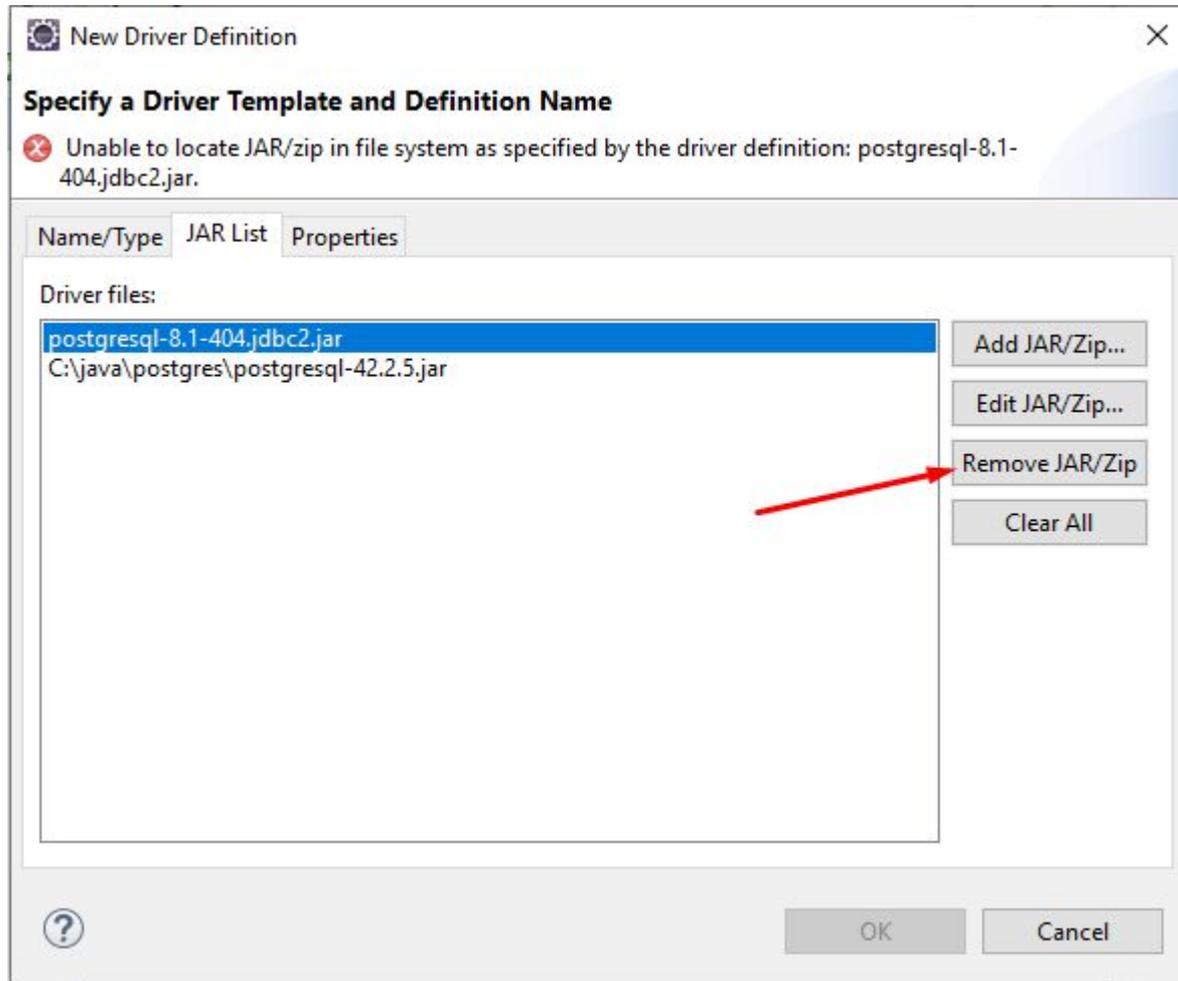
Connect every time the workbench is started

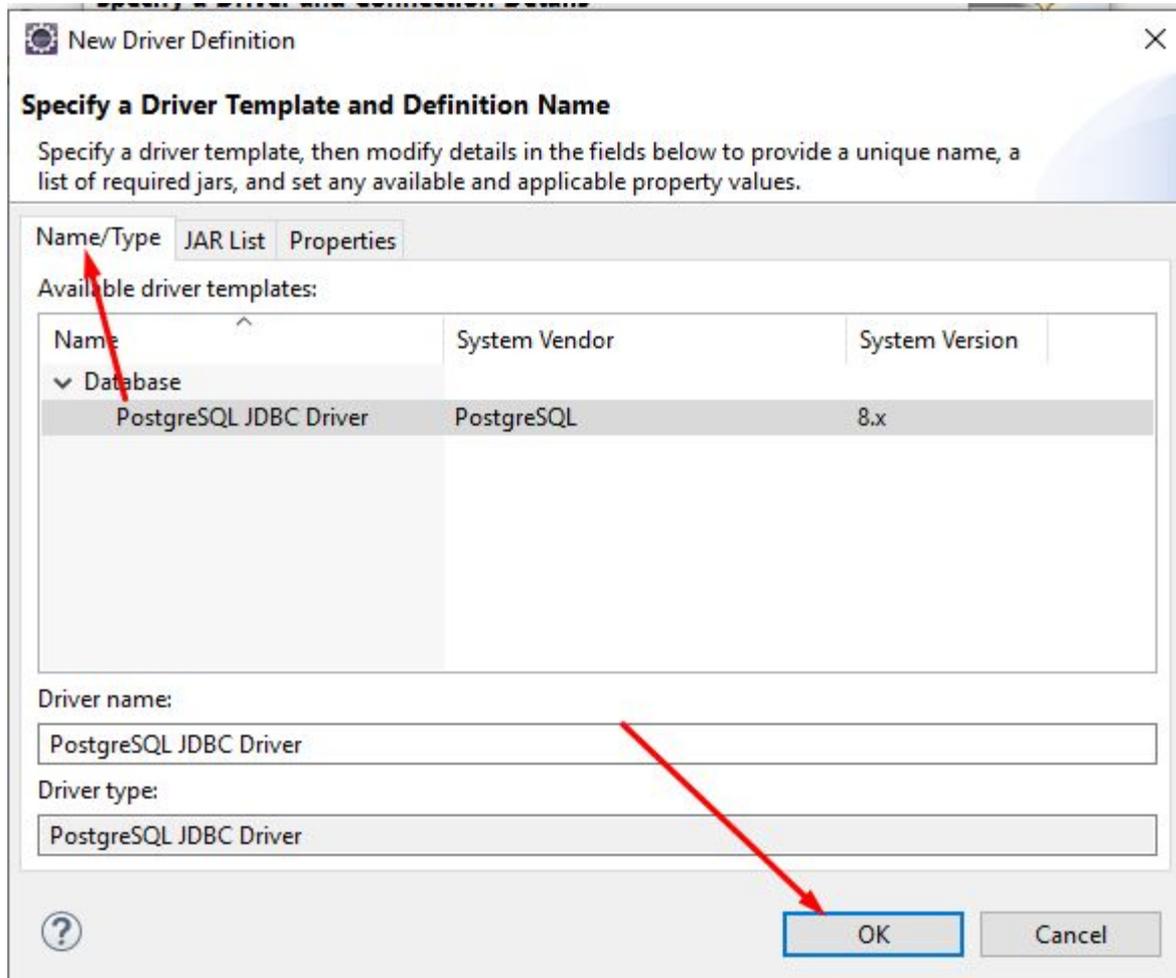
 < Back Next > Finish Cancel











New JDBC Connection Profile

### Specify a Driver and Connection Details

Select a driver from the drop-down and provide login details for the connection.

Drivers: PostgreSQL JDBC Driver

Properties

General Optional

Database: postgres

URL: jdbc:postgresql://localhost:5432/postgres

User name: postgres

Password: ●●●●

Save password

Connect when the wizard completes

Connect every time the workbench is started

Test Connection

< Back Next > Finish Cancel

workspace - SimpleWeb/WebContent/index.jsp - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Ac

Data Source Explorer

- Database Connections
  - Local PostgreSQL (PostgreSQL)
  - postgres
    - Authorization IDs
    - Catalogs
      - postgres
        - Schemas
          - books
            - Dependencies
            - Sequences
            - Stored Procedures
            - Tables
              - BOOKS
              - User-Defined Funct
              - Views
            - information\_schema
            - pg\_catalog
            - public

- ODA Data Sources
- Flat File Data Source
- Web Services Data Source
- XML Data Source

index.jsp

```
1 <%@ page language="java" contentType="text/html; charset=ISO-8859-1"
2   pageEncoding="ISO-8859-1"%>
3
4 <html>
5 <head>
6   <meta charset="ISO-8859-1">
7   <title>Insert title here</title>
8 </head>
9 <body>
10   <h1>Hello World</h1>
11
12 </body>
13 </html>
```

Open scrapbook to edit SQL statements

SQL Results Execution Plan Bookmarks

Status	Operation	Date	Connectio...	Status
--------	-----------	------	--------------	--------

Browser

- > Languages
- ▼ Schemas (2)
  - ▼ books
    - > Collations
    - > Domains
    - > FTS Configurations
    - > FTS Dictionaries
    - > FTS Parsers
    - > FTS Templates
    - > Foreign Tables
    - > Functions
    - > Materialized Views
    - > Sequences
    - ▼ Tables (1)
      - ▼ books
        - > Columns
        - > Constraints
        - > Indexes
        - > Rules
        - > Triggers
    - > Trigger Functions
    - > Types

Dashboard Properties SQL Statistics Dependencies Dependents postgres

```
1 -- Table: books.books
2
3 -- DROP TABLE books.books;
4
5 CREATE TABLE books.books
6 (
7     id integer NOT NULL,
8     name character(250) COLLATE pg_catalog."default" NOT NULL,
9     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)
10 )
11 WITH (
12     OIDS = FALSE
13 )
14 TABLESPACE pg_default;
15
16 ALTER TABLE books.books
17     OWNER to postgres;
```

Browser



Dashboard Properties SQL Statistics Dependencies Dependents postgres

- > Languages
- ▼ Schemas (2)
  - ▼ books
    - > Collations
    - > Domains
    - > FTS Configurations
    - > FTS Dictionaries
    - > FTS Parsers
    - > FTS Templates
    - > Foreign Tables
    - > Functions
    - > Materialized Views
    - > Sequences
    - ▼ Tables (1)
      - ▼ books
      - > Columns
      - > Constraints
      - > Indexes
      - > Rules
      - > Triggers
    - > Trigger Functions
    - > Types

```
1 -- Table: books.books
2
3 -- DROP TABLE books.books;
4
5 CREATE TABLE books.books
6 (
7     id integer NOT NULL,
8     name character(250) COLLATE pg_catalog."default" NOT NULL,
9     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)
10 )
11 WITH (
12     OIDS = FALSE
13 )
14 TABLESPACE pg_default;
15
16 ALTER TABLE books.books
17     OWNER to postgres;
```

Connection profile

Type: postgres\_8.x Name: Local PostgreSQL Database: postgres Status: Connected, Auto Cor

```
1 CREATE TABLE books.books
2 (
3     id integer NOT NULL,
4     name character(250) COLLATE pg_catalog."default" NOT NULL,
5     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)
6 )
7 WITH (
8     OIDS = FALSE
9 )
10 TABLESPACE pg_default;
11
12 ALTER TABLE books.books
13     OWNER to postgres;
14
15 select * from books.books;
```

SQL Results Execution Plan Bookmarks

Status	Operation	Date	Result1
Failed	drop table "books"	20 трав. 201	select * from books.books  Elapsed Time: 0 hr, 0 min, 0 sec, 7 ms.
Failed	drop table books."books"	20 трав. 201	
Failed	drop table books."books"	20 трав. 201	
Failed	select * from books."books"	20 трав. 201	
Success	select * from books."BOOKS"	20 трав. 201	
Success	drop table books."BOOKS"	20 трав. 201	
Success	Group Execution	20 трав. 201	
Success	select * from books.books	20 трав. 201	

```
15 delete from books.books;
16
17 insert into books.books(id, name) values (0, 'Harry Potter 1');
```

SQL Results Execution Plan Bookmarks

Status	Operation	Date	Status
✗ Failed	insert into books.books values(0, "Hol...	20 трав. 201	insert into books.books(id, name) values (0, 'Harry Potter 1')
✗ Failed	insert into books.books (id, name) valu...	20 трав. 201	(1 row affected)
✗ Failed	insert into books.books(id, name) valu...	20 трав. 201	Elapsed Time: 0 hr, 0 min, 0 sec, 5 ms.
✗ Failed	insert into books.books("id", "name") ...	20 трав. 201	
✓ Success	insert into books.books(id, name) valu...	20 трав. 201	
✗ Failed	insert into books.books(id, name) valu...	20 трав. 201	
✓ Success	delete from books.books	20 трав. 201	
✓ Success	insert into books.books(id, name) valu...	20 трав. 201	

workspace - Local PostgreSQL/SQL Scrapbook 0 - Eclipse IDE

File Edit Navigate Search Project Run Window Help

Project Explorer

- HelloWorld
- reverse
- Servers
- SimpleWeb

index.jsp \*SQL Scrapbook 0

Connection profile

Type: postgres\_8.x Name: Local Database: Status: Connected, ,

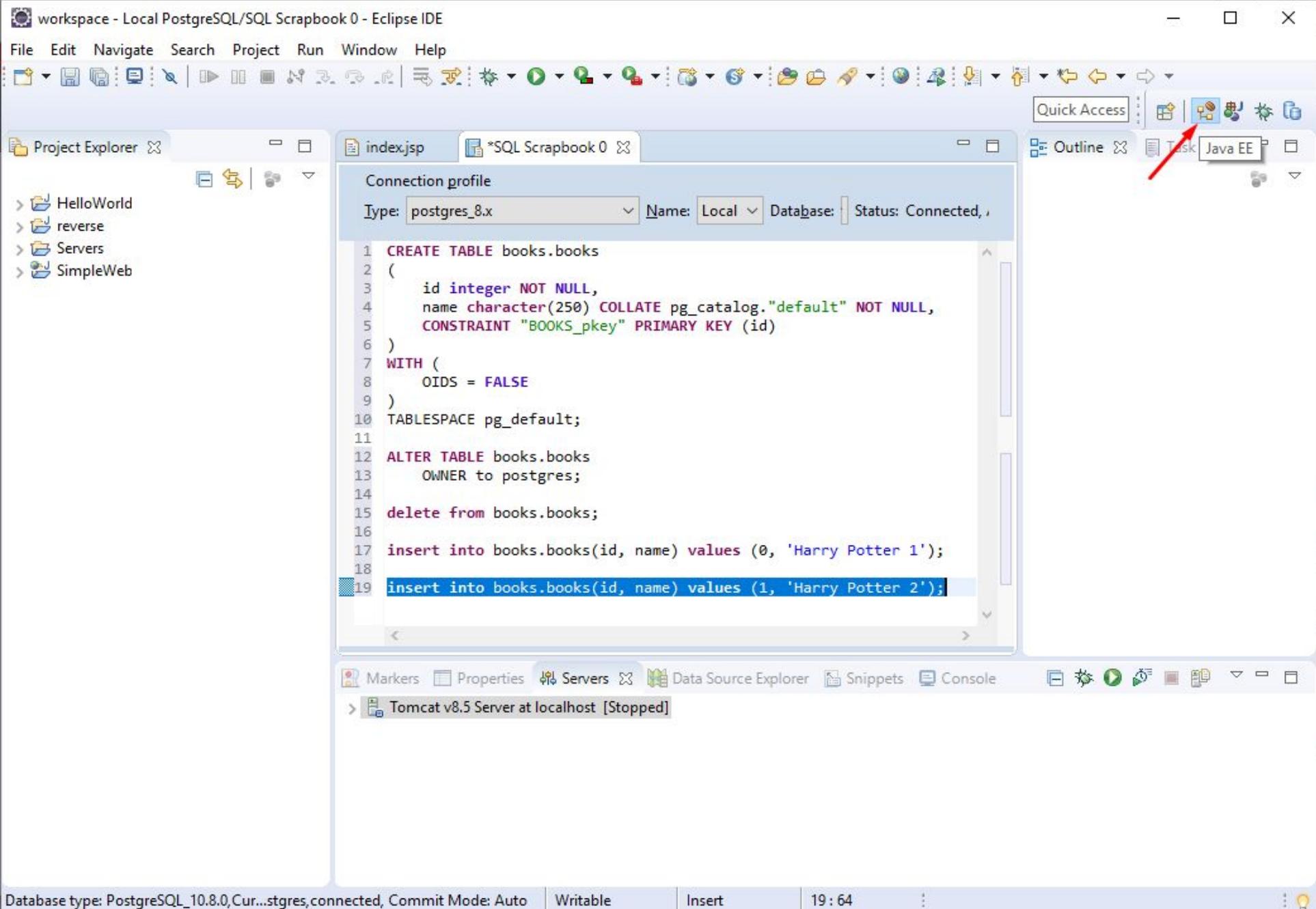
```
1 CREATE TABLE books.books
2 (
3     id integer NOT NULL,
4     name character(250) COLLATE pg_catalog."default" NOT NULL,
5     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)
6 )
7 WITH (
8     OIDS = FALSE
9 )
10 TABLESPACE pg_default;
11
12 ALTER TABLE books.books
13     OWNER to postgres;
14
15 delete from books.books;
16
17 insert into books.books(id, name) values (0, 'Harry Potter 1');
18
19 insert into books.books(id, name) values (1, 'Harry Potter 2');
```

Quick Access Task Java EE

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v8.5 Server at localhost [Stopped]

Database type: PostgreSQL\_10.8.0, Cur...stgres, connected, Commit Mode: Auto Writable Insert 19 : 64



Project Explorer:

- > HelloWorld
- > reverse
- > Servers
- > SimpleWeb

Connection profile:

Type: postgres\_8.x Name: Local Data

```
1 CREATE TABLE books.books
2 (
3     id integer NOT NULL,
4     name character(250) COLLATE pg_catalog."def
5     CONSTRAINT "BOOKS_pkey" PRIMARY KEY (id)
```

Context Menu:

- New > Project...
- Show In Alt+Shift+W >
- Copy Ctrl+C
- Copy Qualified Name
- Paste Ctrl+V
- Delete Delete
- Import >

Sub-menu (Dynamic Web Project selected):

- Project...
- Application Client Project
- Connector Project
- Dynamic Web Project
- EJB Project
- Enterprise Application Project
- Static Web Project
- Web Fragment Project

Properties for DynamicWeb

type filter text

- > Resource
- Builders
- Coverage
- Deployment Assembly
- Java Build Path**
- > Java Code Style
- > Java Compiler
- > Java Editor
- Javadoc Location
- > JavaScript
- JSP Fragment
- Project Facets
- Project Natures
- Project References
- Refactoring History
- Run/Debug Settings
- Server
- Service Policies
- Targeted Runtimes
- > Task Repository
- Task Tags
- > Validation
- Web Content Settings
- Web Page Editor

### Java Build Path

Source Projects Libraries Order and Export

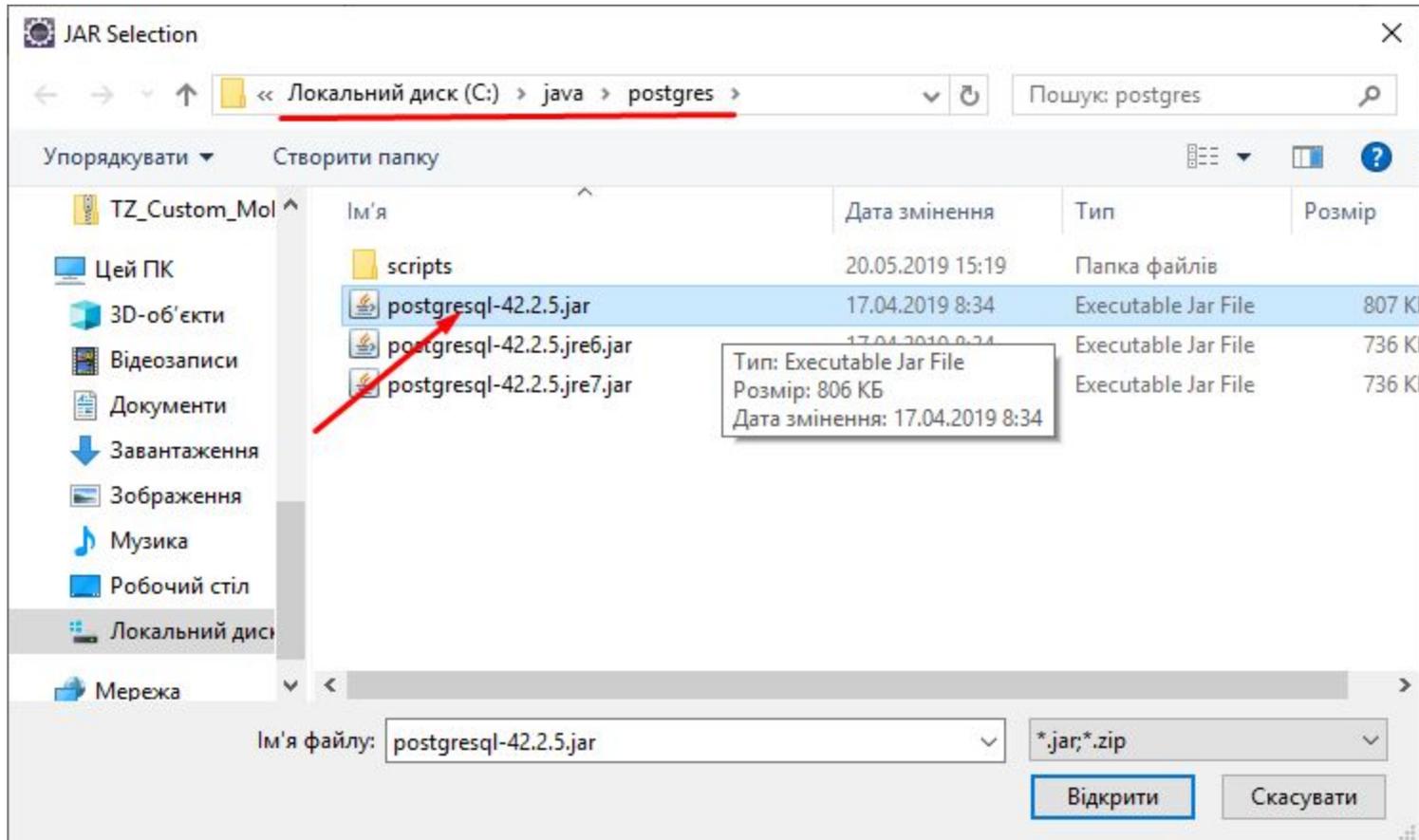
JARs and class folders on the build path:

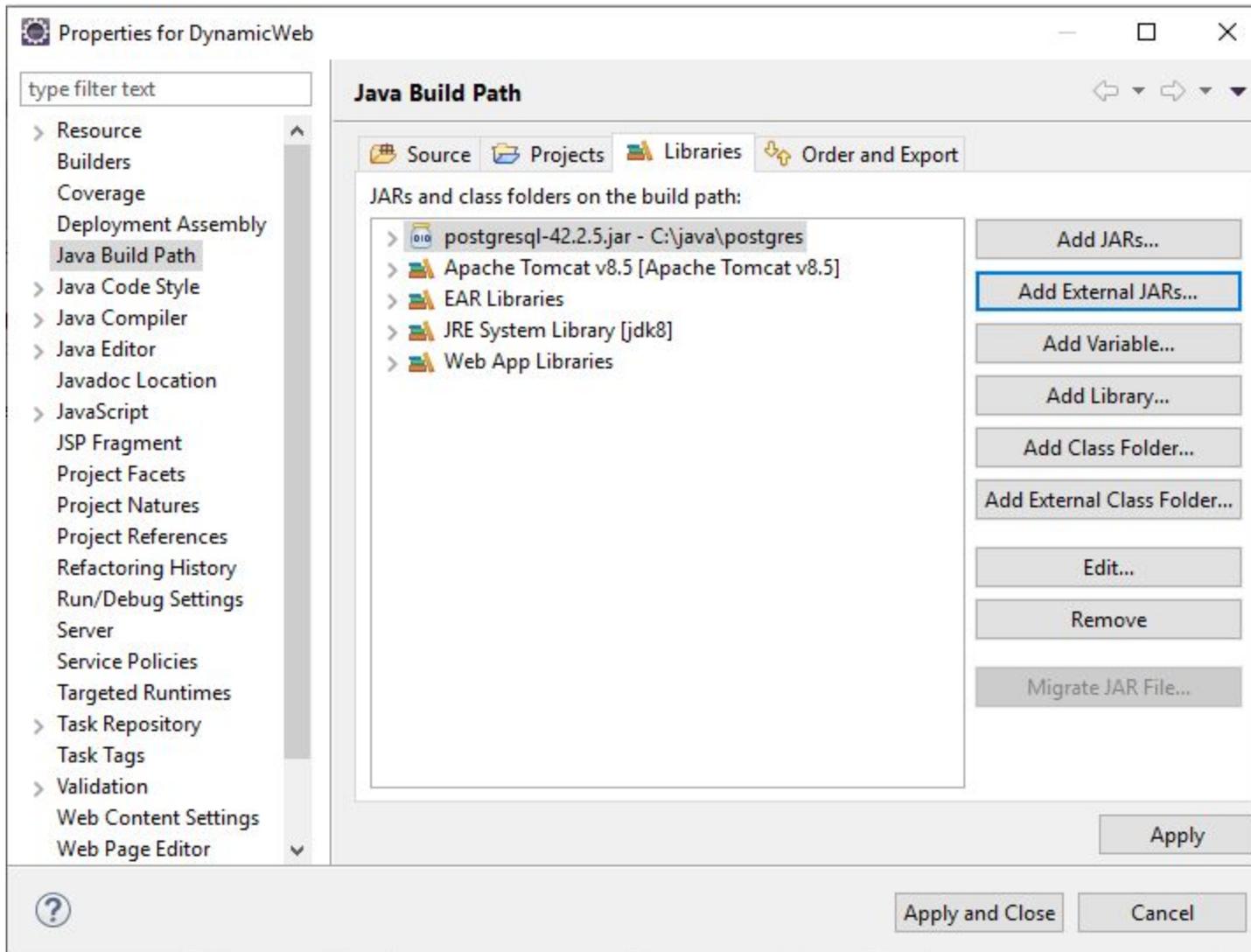
- > Apache Tomcat v8.5 [Apache Tomcat v8.5]
- > EAR Libraries
- > JRE System Library [jdk8]
- > **Web App Libraries**

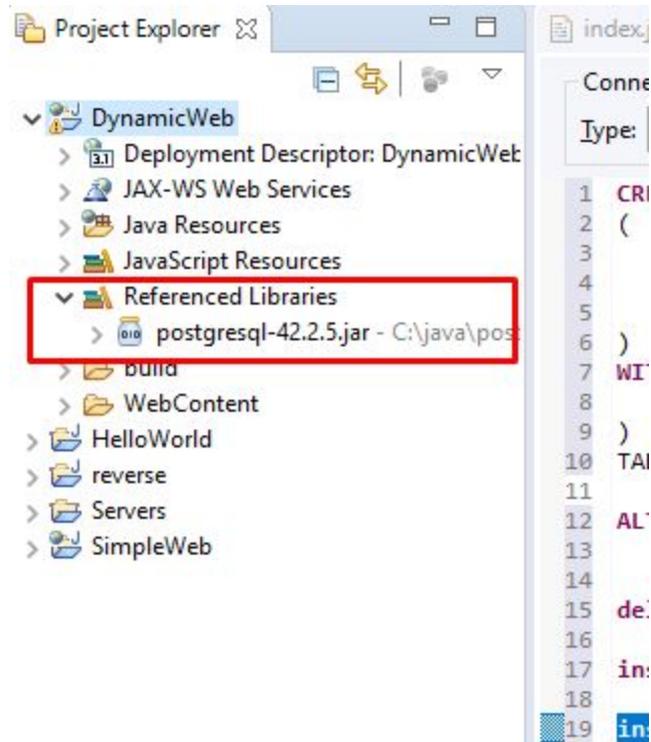
Add JARs...  
Add External JARs...  
Add Variable...  
Add Library...  
Add Class Folder...  
Add External Class Folder...  
Edit...  
Remove  
Migrate JAR File...

Apply

Apply and Close Cancel







Теория

# JDBC (Java Data Base Connectivity)

# Основные понятия

- ❑ Единый интерфейс
- ❑ ClassLoader
- ❑ JAVA\_PATH

# Connect

```
Class.forName("full.driver.class");
```

```
Connection con =
```

```
DriverManager.getConnection(URL, Properties);
```

```
//URL: jdbc:oracle://host:port/SID
```

```
//MySQL: jdbc:mysql://host:port?var1=val1&...
```

# Statements & ResultState

```
Statement st = con.createStatement();
ResultSet rs = st.executeQuery("SQL
statement");
while(rs.next()){
    String s = rs.getString(1);
    int i = rs.getInt(2);
    String name = rs.getString("name");
}
```

# Close

- ❑ Устанавливается реальное соединение
- ❑ Закрываются объекты в обратном порядке
- ❑ Connection pool

Теория

# JDBC (Java Data Base Connectivity)

workspace - SimpleWeb/WebContent/index

File Edit Navigate Search Project Run

Project Explorer

- DynamicWeb
  - Deployment Descriptor: DynamicWeb
  - JAX-WS Web Services
  - Java Resources**
    - src
    - Libraries
  - JavaScript Resources
  - Referenced Libraries
    - postgresql-42.2.5.jar - C:\java\post
    - build
    - WebContent
  - HelloWorld
  - reverse
  - Servers
  - SimpleWeb

### Create a new Java class.

Source folder:

Package:

Enclosing type:

Name:

Modifiers:  public  package  private  protected  
 abstract  final  static

Superclass:

Interfaces:

Which method stubs would you like to create?

- public static void main(String[] args)
- Constructors from superclass
- Inherited abstract methods

Do you want to add comments? (Configure templates and default value [here](#))

- Generate comments

The screenshot shows an IDE with three tabs: `*index.jsp`, `*SQL Scrapbook 0`, and `*DatabaseFacade.java`. The `DatabaseFacade.java` tab is active, showing the following code:

```
1 package ua.com.foxminded.db;
2
3 public class DatabaseFacade {
4
5
6 public static List<String> getBooks(){
7
8 }
9
10 }
11
```

The `List<String>` in line 6 is selected, and a code completion popup is displayed with the following options:

- ← Import 'List' (com.sun.xml.internal.bind.v2.schemagen.xmlschema)
- ← Import 'List' (java.awt)
- ← Import 'List' (java.util)
- ⊕ Create class 'List<T>'
- ⓘ Create interface 'List<T>'
- ↗ Change to 'LCONST' (com.sun.org.apache.bcel.internal.generic)
- ↗ Change to 'Light' (com.sun.scenario.effect.light)
- ↗ Change to 'Light' (javafx.scene.effect)
- ↗ Change to 'Line' (javafx.scene.shape)
- ↗ Change to 'Line' (javafx.sound.sampled)
- ↗ Change to 'Link' (sun.awt.image.ImageWatched)
- ↗ Change to 'ListCell' (javafx.scene.control)

At the bottom of the popup, it says: "Press 'Ctrl+1' to go to original position".

The Outline window on the right shows the project structure:

- ua.com.foxminded.db
  - DatabaseFacade
    - getBooks() : List<String>

The code completion popup also shows a preview of the code with the selected option highlighted:

```
...
package ua.com.foxminded.db;

import java.util.List;

public class DatabaseFacade {
...

```

At the bottom of the popup, it says: "Press 'Tab' from proposal table or click for..."

## Overview

### General Information

Specify the host name and other common settings.

Server name:

Host name:

Runtime Environment:

Configuration path:

[Open launch configuration](#)

### Server Locations

Specify the server path (i.e. catalina.base) and deploy path. Server must be published with no modules present to make changes.

- Use workspace metadata (does not modify Tomcat installation)
- Use Tomcat installation (takes control of Tomcat installation)
- Use custom location (does not modify Tomcat installation)

Server path:

[Set deploy path to the default value \(currently set\)](#)

Deploy path:

### Server Options

Enter settings for the server.

- Serve modules without publishing
- Publish module contexts to separate XML files
- Modules auto reload by default
- Enable security
- Enable Tomcat debug logging (not supported by this Tomcat version)

Overview Modules

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v8.5 Server at localhost [Started, Synchronized]

DynamicWeb [Synchronized]

SimpleWeb [Synchronized]

**Tomcat v8.5 Server at localhost**  
Apache Tomcat v8.5 - 2 modules  
Press 'F6' for Focus.

### Publishing

### Timeouts

### Ports

Modify the server ports.

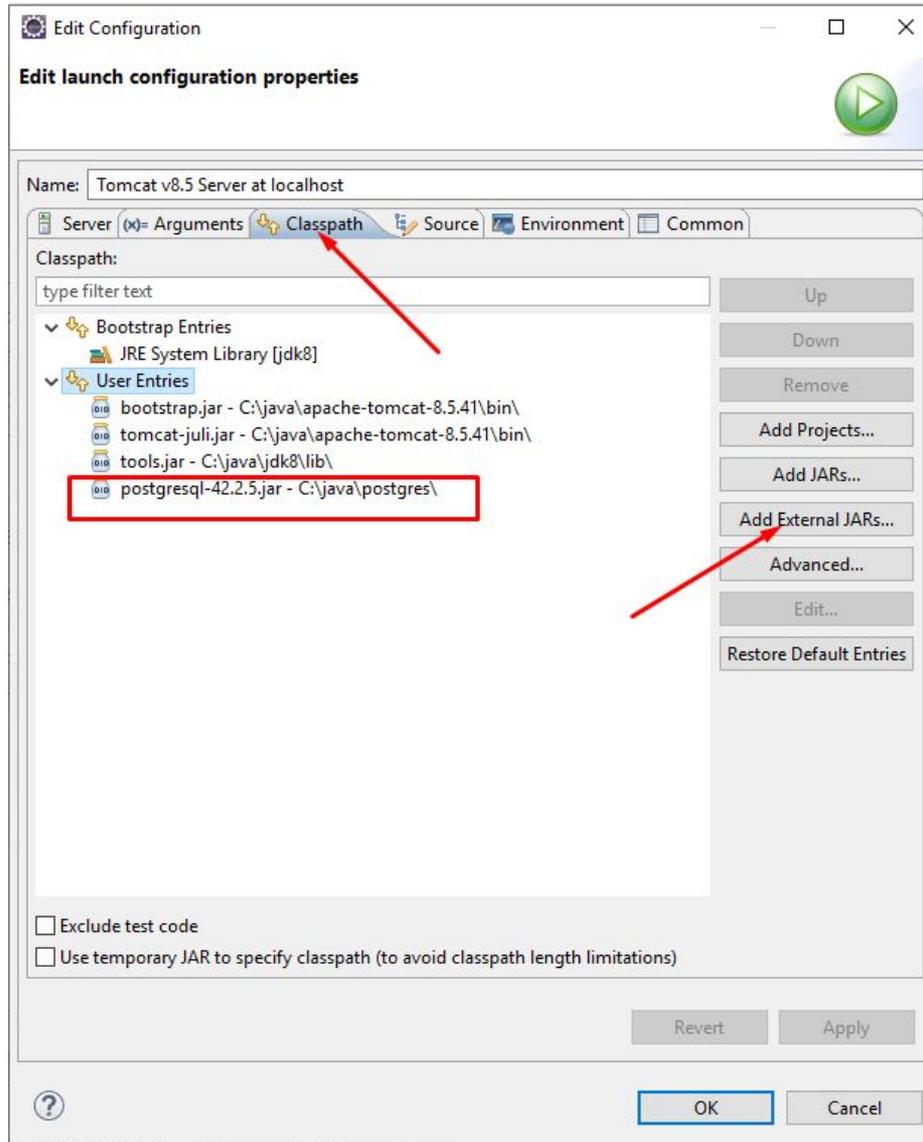
Port Name

Tomcat admin port

HTTP/1.1

AJP/1.3

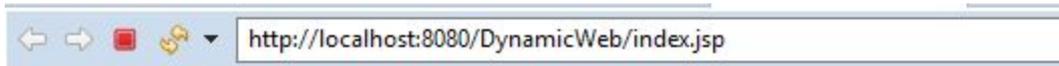
### MIME Mappings



```
3 import java.sql.Connection;
4 import java.sql.DriverManager;
5 import java.sql.ResultSet;
6 import java.sql.SQLException;
7 import java.sql.Statement;
8 import java.util.ArrayList;
9 import java.util.List;
10
11 public class DatabaseFacade {
12
13     public static List<String> getBooks() {
14
15         List<String> result = new ArrayList<String>();
16
17
18         try (Connection connection = DriverManager.getConnection("jdbc:postgresql://localhost:5432/postgres",
19             "postgres", "1234")) {
20
21             System.out.println("Java JDBC PostgreSQL Example");
22
23
24
25             System.out.println("Connected to PostgreSQL database!");
26             Statement statement = connection.createStatement();
27
28             ResultSet resultSet = statement.executeQuery("SELECT * FROM books.books");
29             while (resultSet.next()) {
30                 result.add(resultSet.getString("name"));
31             }
32
33         } catch (SQLException e) {
34             System.out.println("Connection failure.");
35             e.printStackTrace();
36         }
37         return result;
38     }
39 }
40
41 }
42
```

```
index.jsp DatabaseFacade.java index.jsp Insert title here Tomcat v8.5 Server at localhost
1 <%@ page language="java" contentType="text/html; charset=ISO-8859-1"
2   pageEncoding="ISO-8859-1"%>
3
4 <%@ page import="ua.com.foxminded.db.*"%>
5
6 <!DOCTYPE html>
7 <html>
8 <head>
9   <meta charset="ISO-8859-1">
10  <title>Insert title here</title>
11 </head>
12 <body>
13   <h1>Hello World</h1>
14   <br>
15   <%
16     for(String name : DatabaseFacade.getBooks()){
17       out.println(name + "<br/>");
18     }
19   %>
20
21 </body>
22 </html>
```

The screenshot shows the 'Servers' view in an IDE. The view is titled 'Tomcat v8.5 Server at localhost [Started, Synchronized]'. Underneath this title, there are two sub-projects listed: 'DynamicWeb [Synchronized]' and 'SimpleWeb [Synchronized]'. The IDE's toolbar is visible at the top of the view, containing icons for Markers, Properties, Servers, Data Source Explorer, Snippets, and Console. A vertical line is drawn above the 'Servers' view, extending from the top of the IDE window.



# Hello World

Harry Potter 1  
Harry Potter 2

# Ваши вопросы



<http://foxmindEd.com>

