

Laboratory Manual 5.4

5.4 Design and Build a Report



Objectives

After completing this lab session, you should be able to do the following:-

- Install NetBeans Reporting tool plugins
- Become familiar with Java open source reporting tools
- Design and build report using iReport tool
- Call and integrate JasperReports XML/jasper file in Java application

Required Software

- iReport 5.5.0 plugin
- NetBeans IDE 7.4 or later

5.4.1 Introduction

Report is a Meaningful, well summarized nicely formatted way of presenting data from the database. Usually the routine activities are automated and data summarized into a decision-supporting format "Reports". Reports act as wonders when it converts the usual messy data into attractive charts, and graphical representations.

Open source JAVA reporting tools,

- JasperReports
 - is an engine that takes an XML file and forms a report out of that file using the data source specified in the XML file.
- iReport and
 - is a visual tool to obtain XML files for JasperReports.
- JFreeChart
 - is a free Java class library for generating charts.
 - Installing iReport Plugins

5.4.2 Installing iReport plugin

- i. Get the from your lab Assistant/Instructor or Download the latest version iReport plugin (as of this writing is 5.5.0) from www.netbeans.org that is compatible to your NetBeans IDE version (Figure 1)
- ii. Go to www.netbeans.org, click “Plugins” (Figure 1[1]) link, click “iReport” (Figure 1[2])link

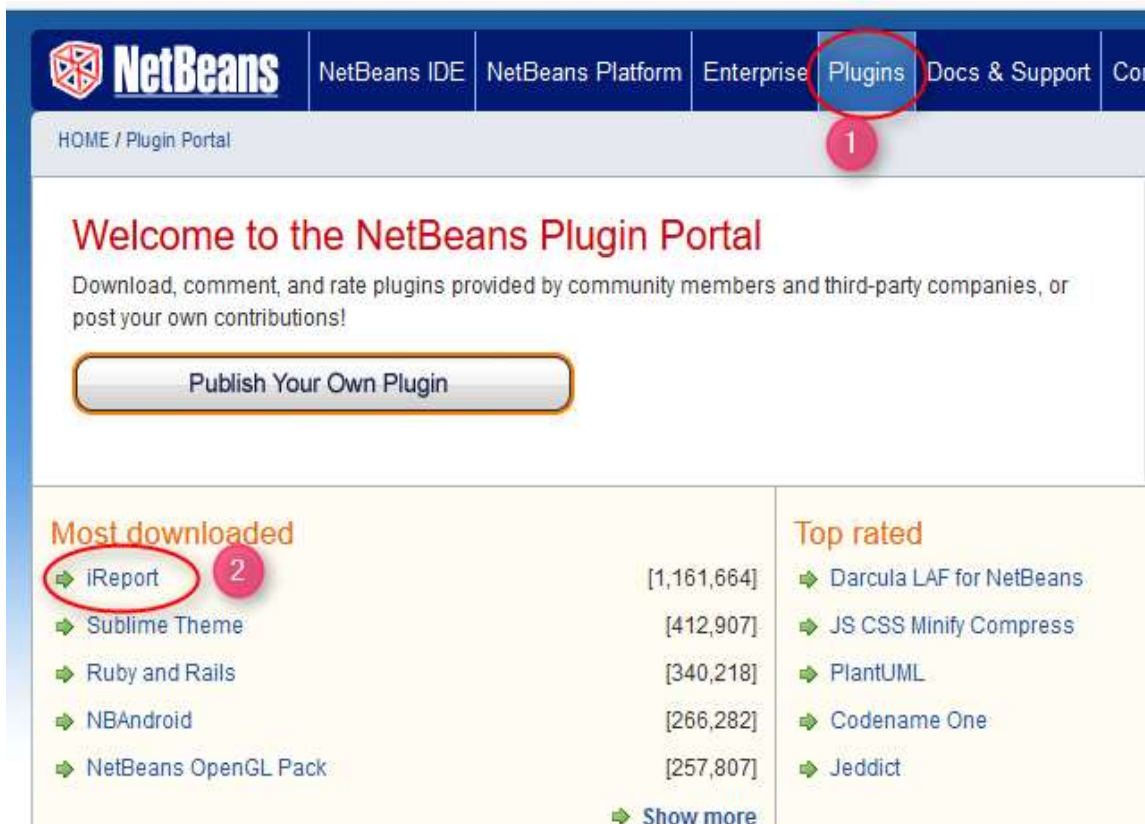


Figure 1

- iii. Select Your Netbeans IDE version (Figure 2[1]) and download iReport plugins for your IDEDownload (Figure 2[2])



Figure 2

- iv. Unpack the file “1383067774_iReport-5.5.0-plugin” (Figure 3[1]), you will get four files (Figure 3[2])

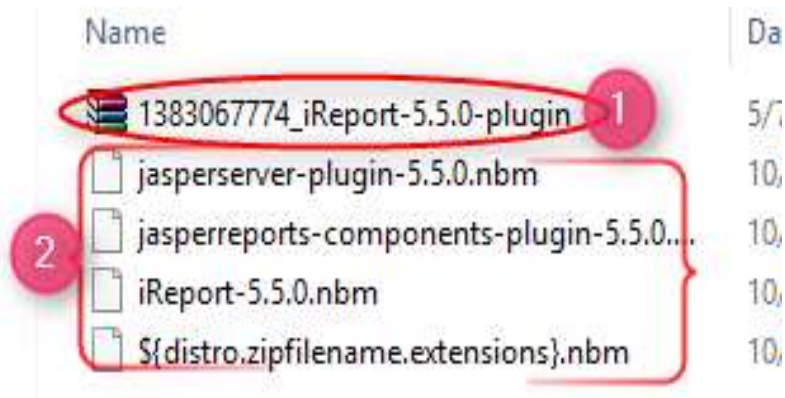


Figure 3

- v. Open your NetBeans IDE,
i. Go to “**Tools**” menu, select “**plugin**” (Figure 4)



Figure 4

- ii. Click “**Download**” tab, click “**Add plugin...**” (Figure 5)

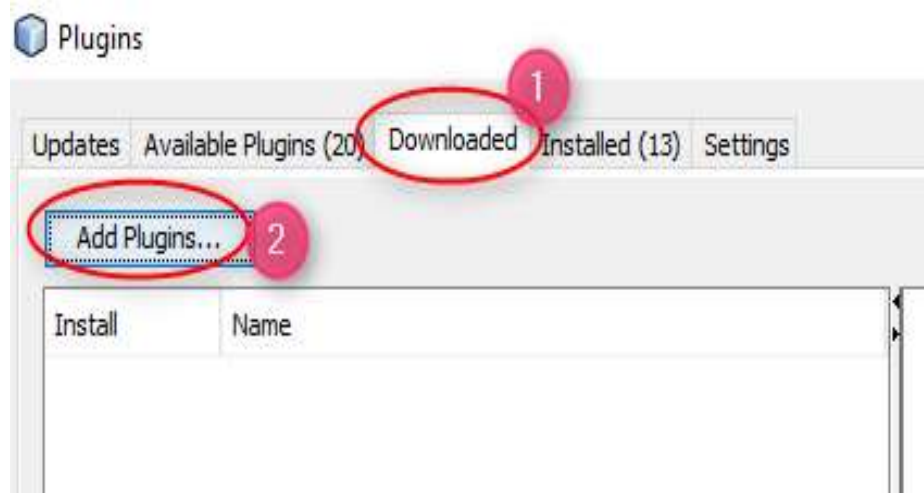


Figure 5

- iii. Browse to the unpacked file, select all four files (Figure 6)

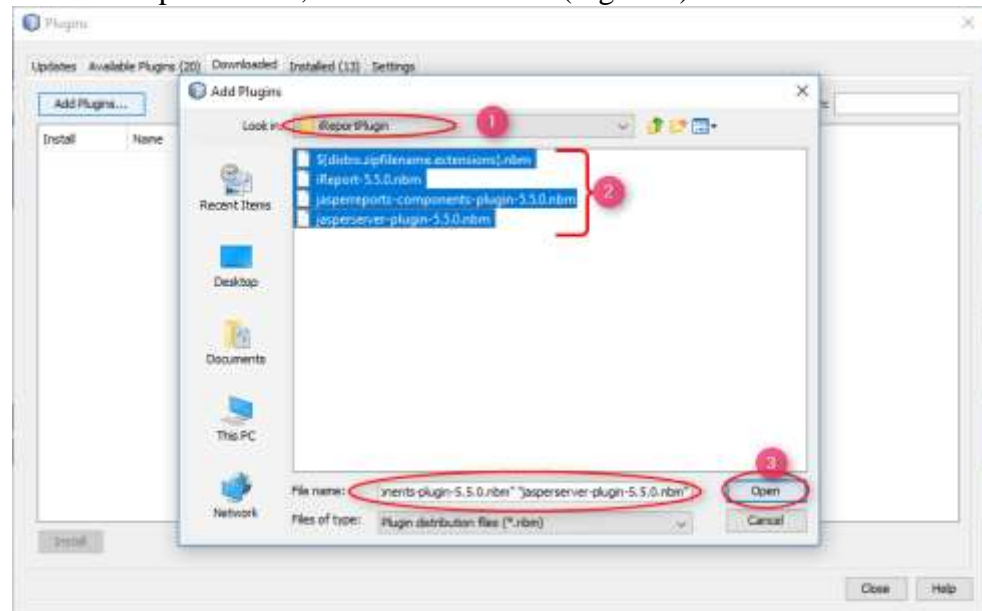


Figure 6

- iv. Install the plugins, follow the wizard (Figure 7)

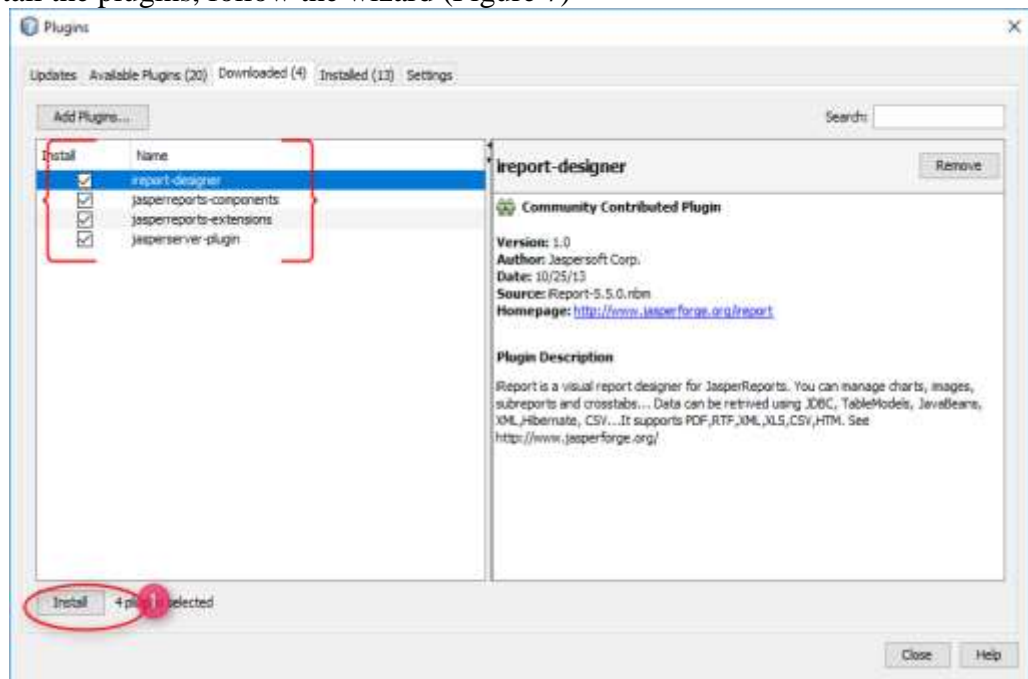


Figure 7

- v. Follow the installation wizard. (Figure 8)

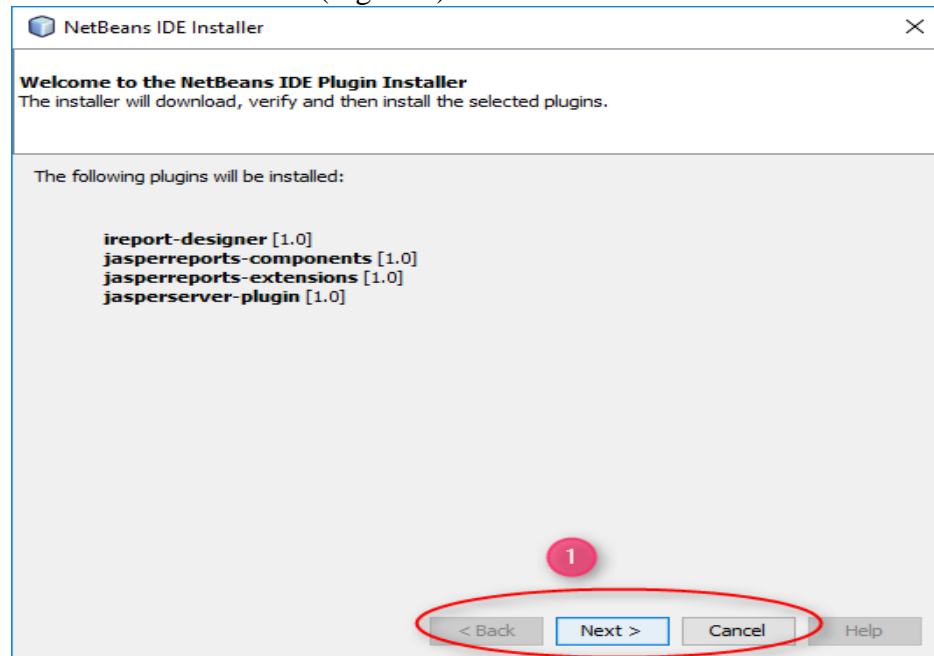


Figure 8

- vi. If you got warning, click continue and finish the installation.(Figure 9)

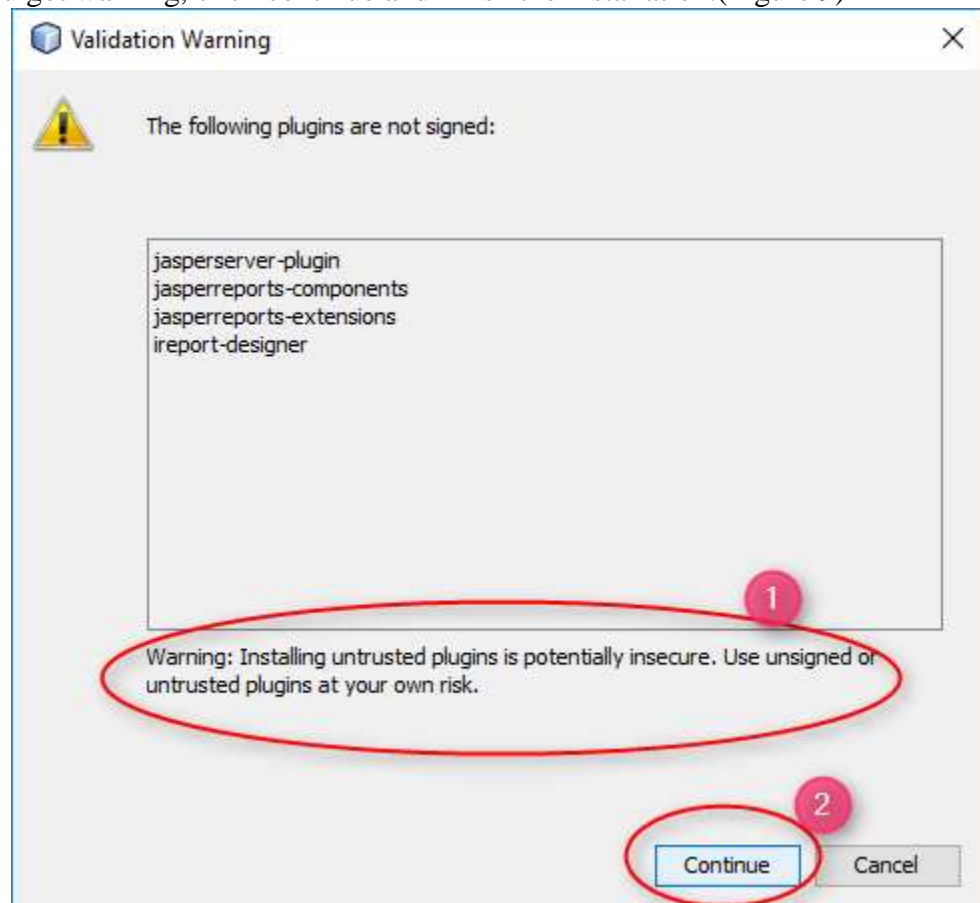


Figure 9

- vii. Restart NetBeans IDE (close and Reopen)
- viii. The NetBeans IDE brings “Welcome window”(Figure 10 [1]) and steps how to Get started in designing report using iReport (Figure 10[2])

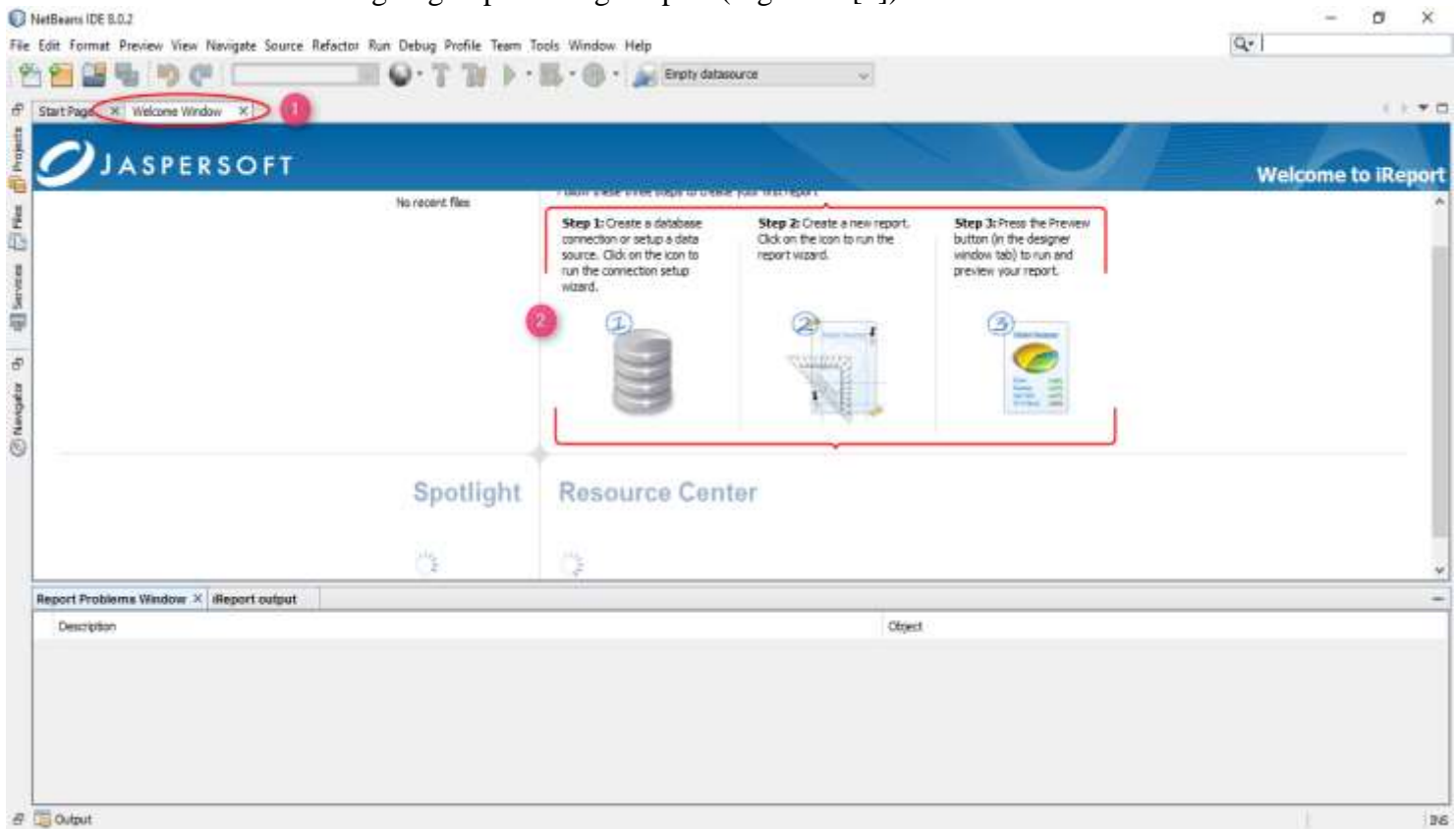


Figure 10 : iReport welcome page in NetBeansIDE

5.4.3 Using iReport to Design a Report

Start designing a report using iReport plugin features

- i. Open the “RegistrarSystem” project
- ii. Create a package called “**report**” (it is optional, recommended)
- iii. Right click on your project(package”report”), **New**, select **Others**
- iv. Select **Report** category, Select **Report wizard** (Figure 11), **Next**

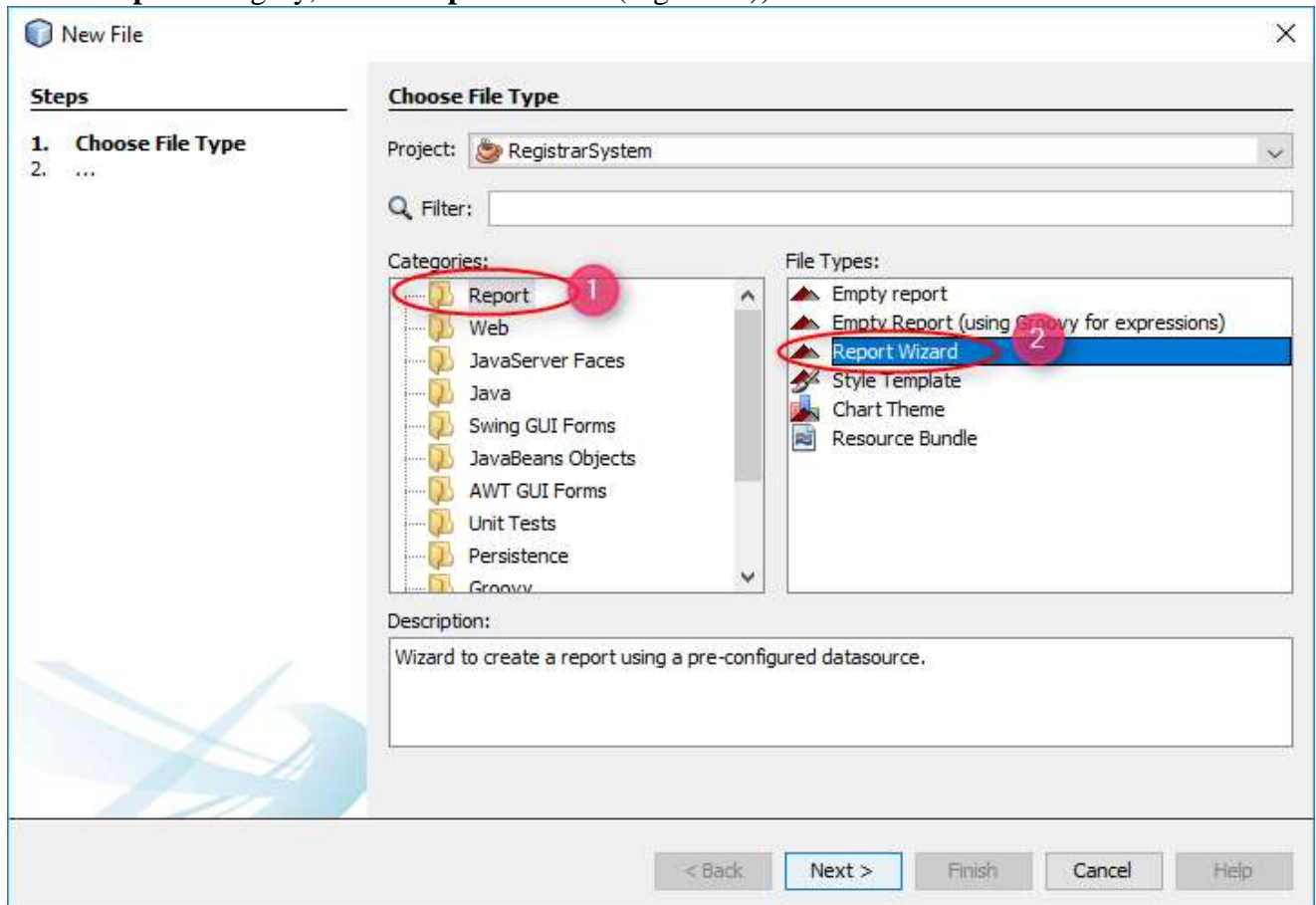


Figure 11

- v. Select report template/layout
Select “Blank A4 Landscape” to start from scratch, or you can select an initial template (Figure 12),
Click Next

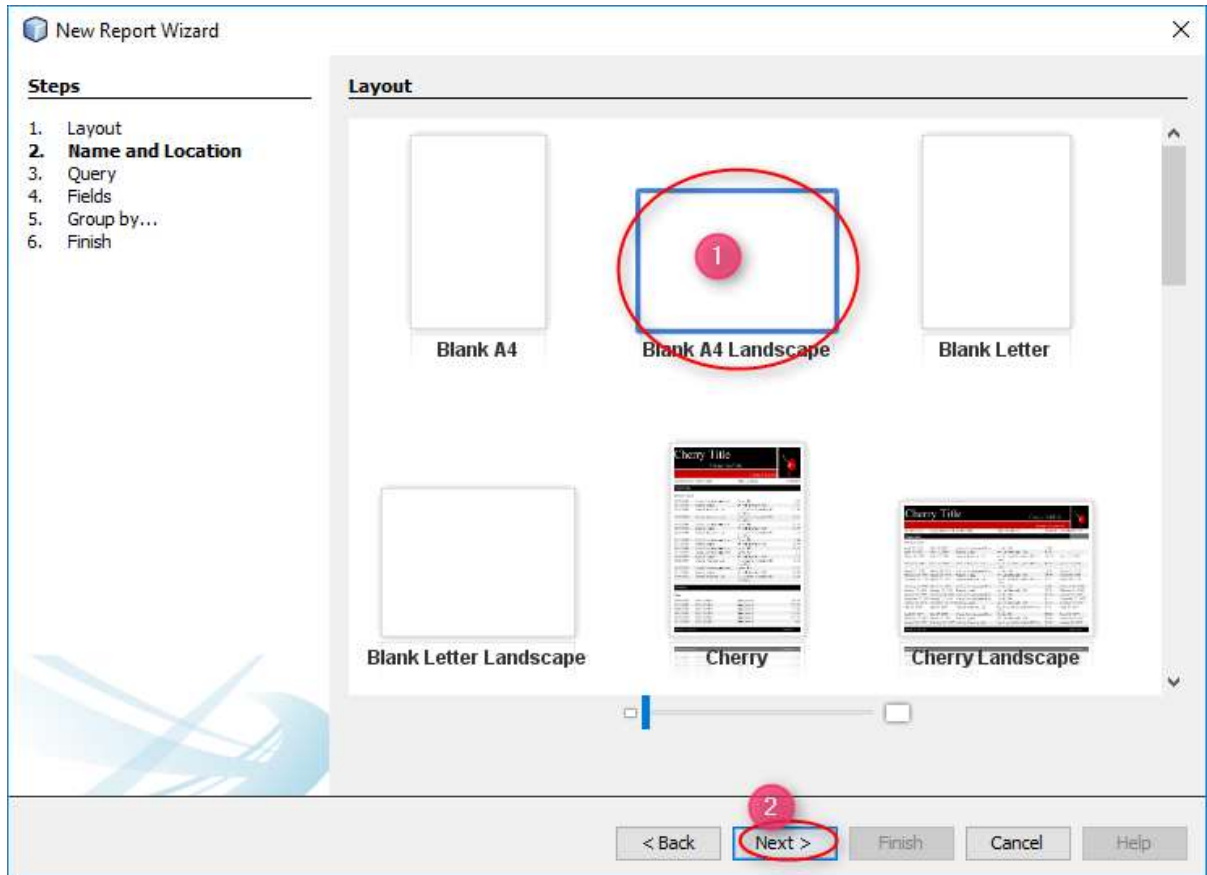


Figure 12

vi. Give report file name “FacultyList.jrxml”, Next (Figure 13)

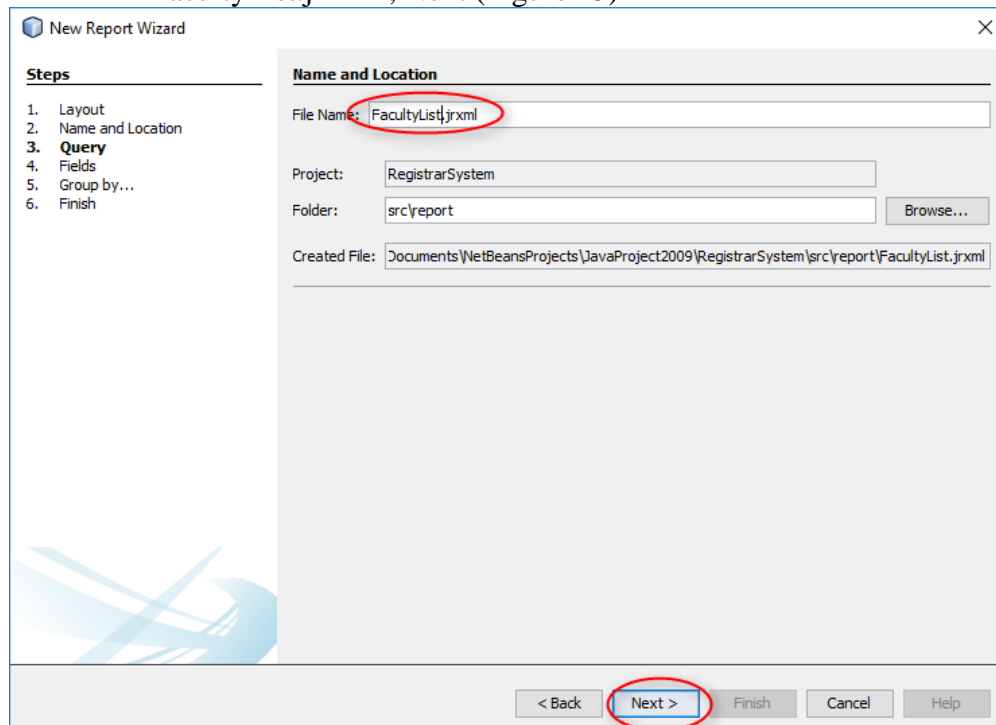


Figure 13

- vii. Configure database connection string
 Connection/Data Source: Click New button (Figure 14)

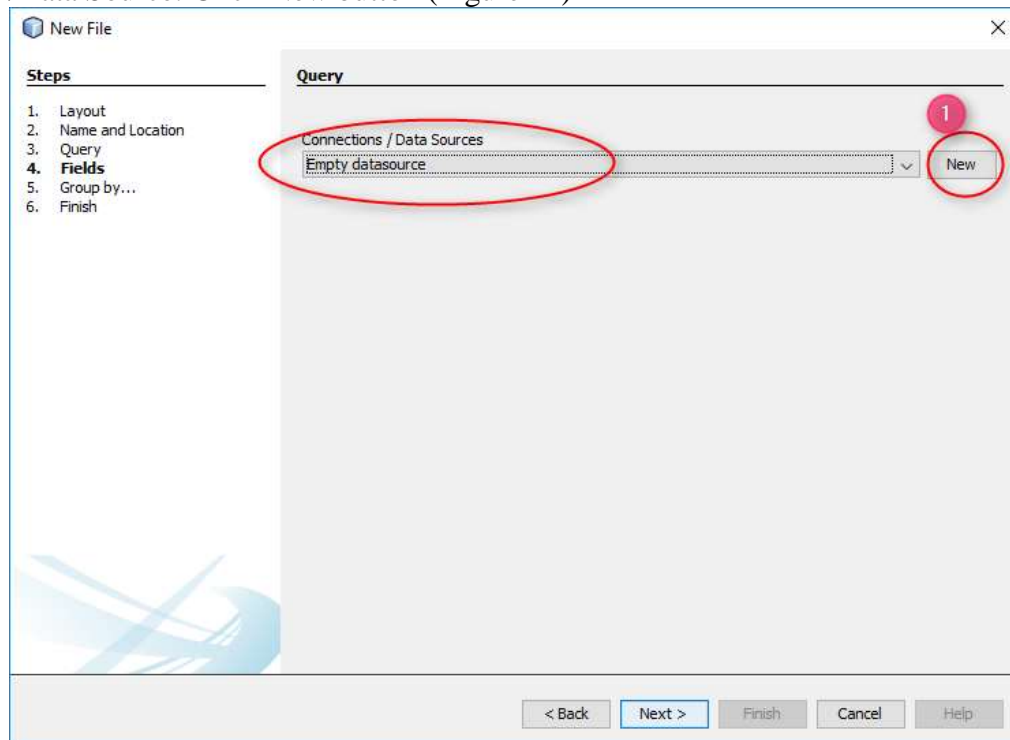


Figure 14

- viii. Select Data Source “Database JDBC Connection” (Figure 15), Next

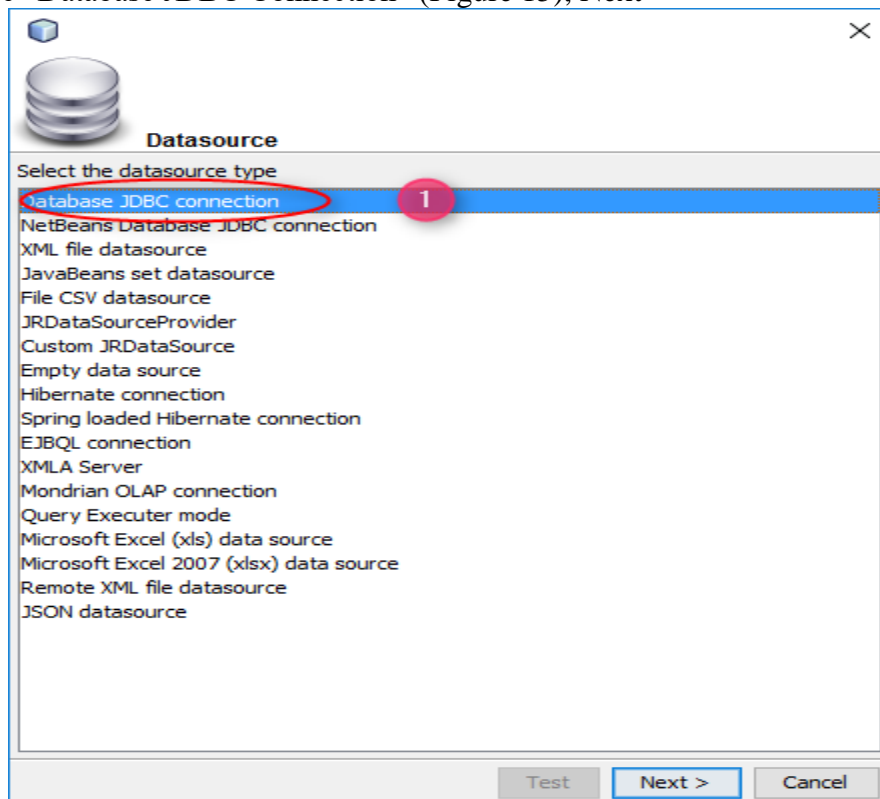


Figure 15

- ix. Fill Database JDBC connection credentials, click “Test” and then click “Save” (Figure 16)

Name: RegistrarSystem

JDBC Driver: Oracle (oracle.jdbc.driver.OracleDriver)

JDBC URL : jdbc:oracle:thin:@localhost:1521:XE

Username : Registrar

Password : 1234

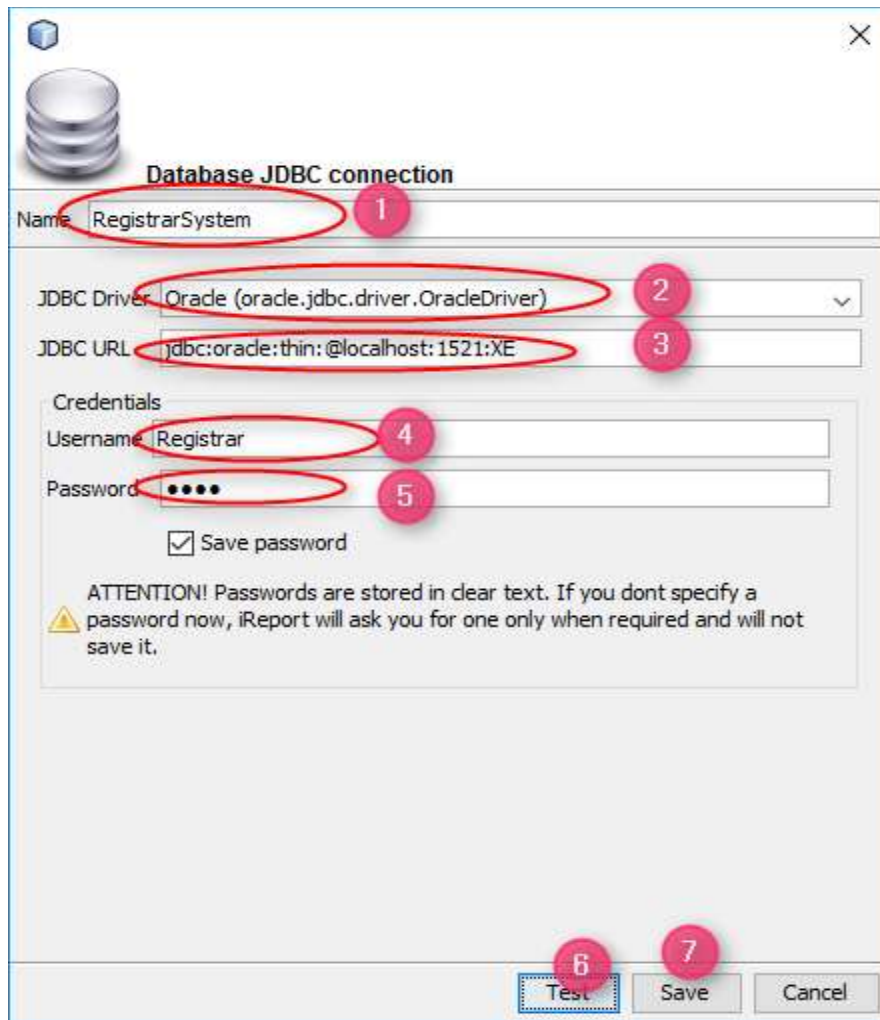
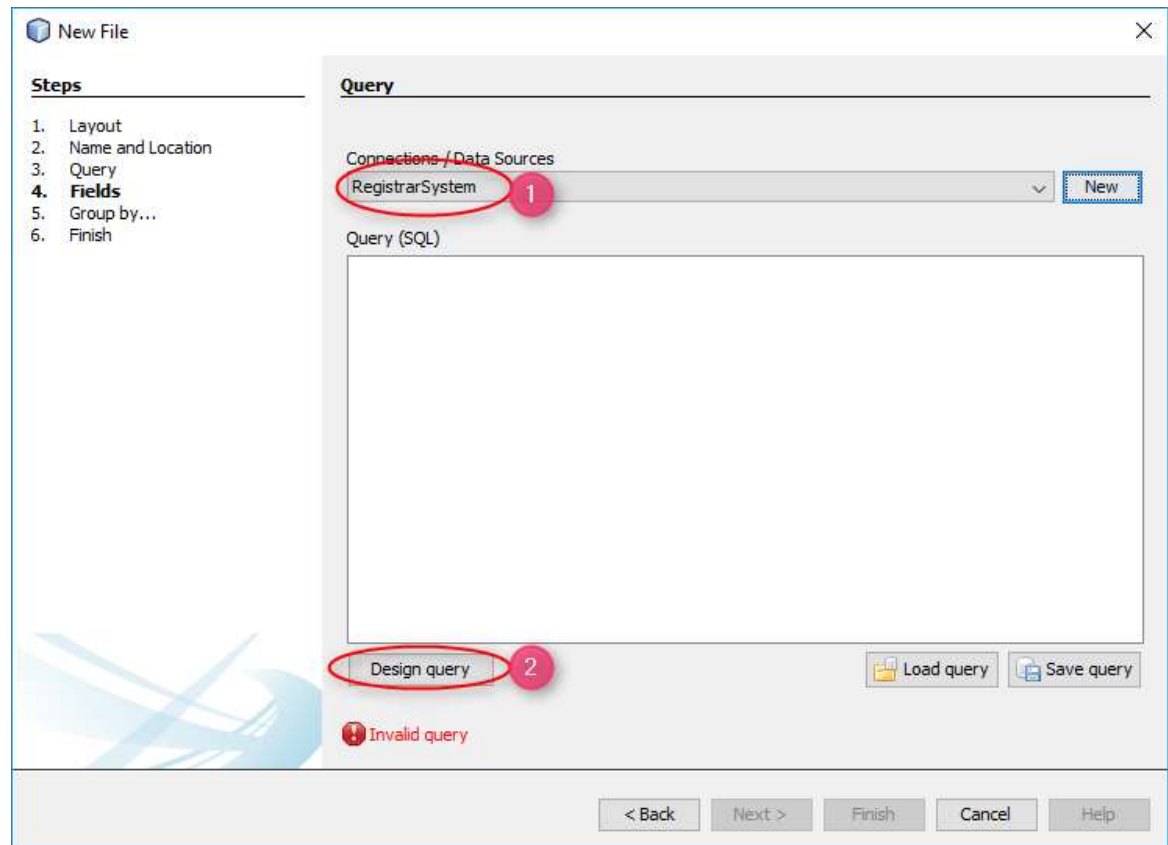


Figure 16

- x. Design query for the report
- Select Your connection “RegistrarSystem” (Figure 17[1])
 - Click “Design Query” button (Figure 17[2])

*Figure 17*

- iii. Select "Select" under "ROOTQUERY" (Figure 18[1])
- iv. Select "Registrar" database (Figure 18[2])
- v. Select "Table" object (Figure 18[3])
- vi. Drag "FACULTY" table to the Design area (Figure 18[4])
- vii. Select all fields except Faculty_Code (Figure 18[5])
- viii. You click "Syntax" tab and view the SQL statement for your query
- ix. Click "Ok"

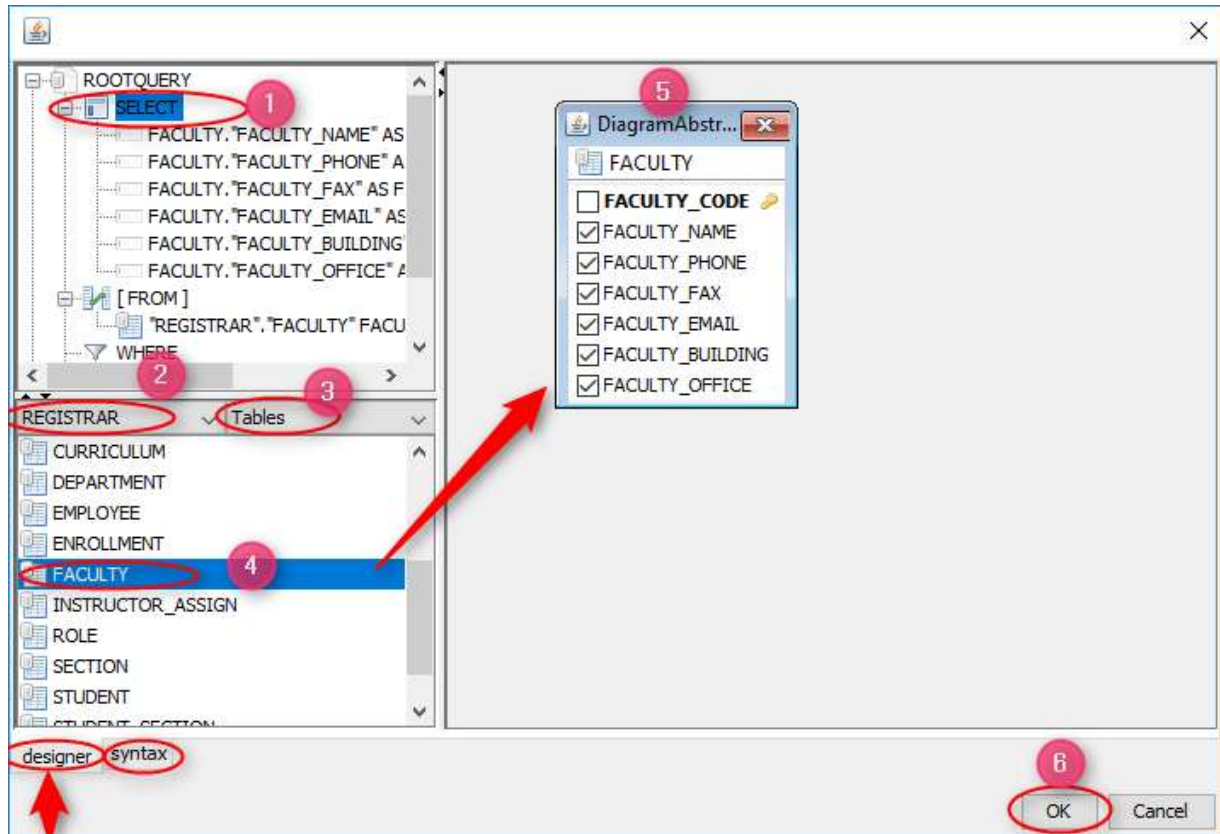


Figure 18

- x. Check your SQL query and click “Next” (Figure 19)

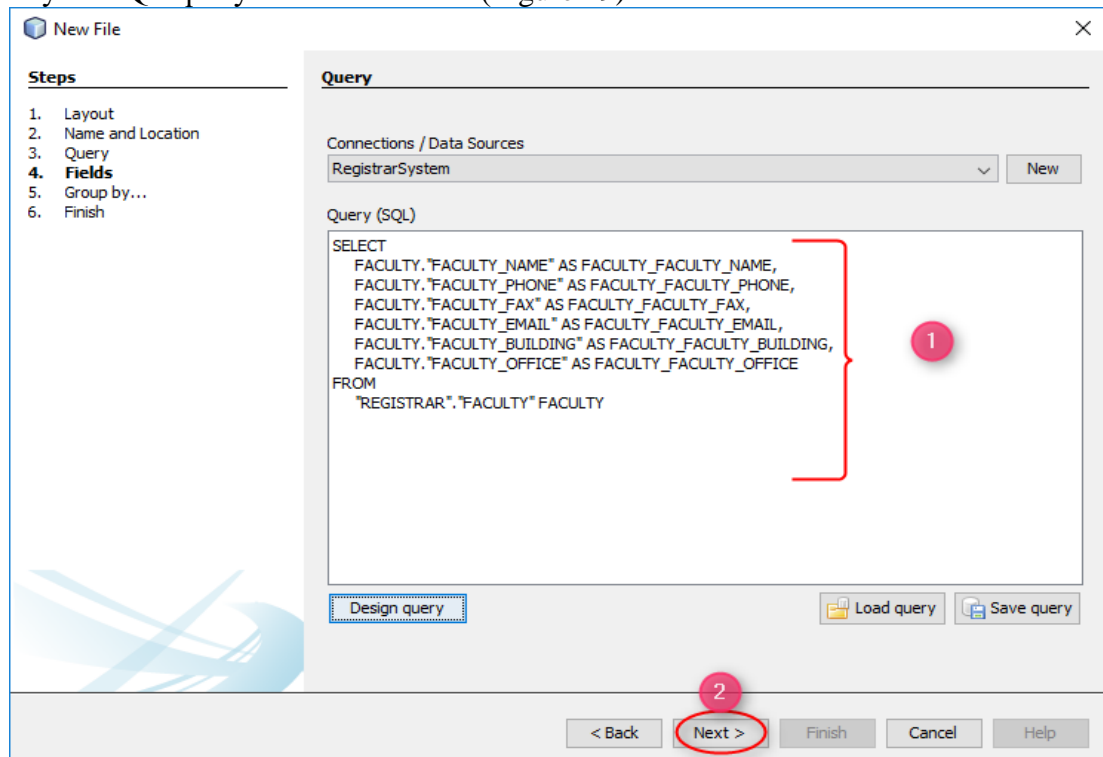


Figure 19

- xi. Select fields that you want to appear on the report, select all fields now (Figure 20)

Figure 19

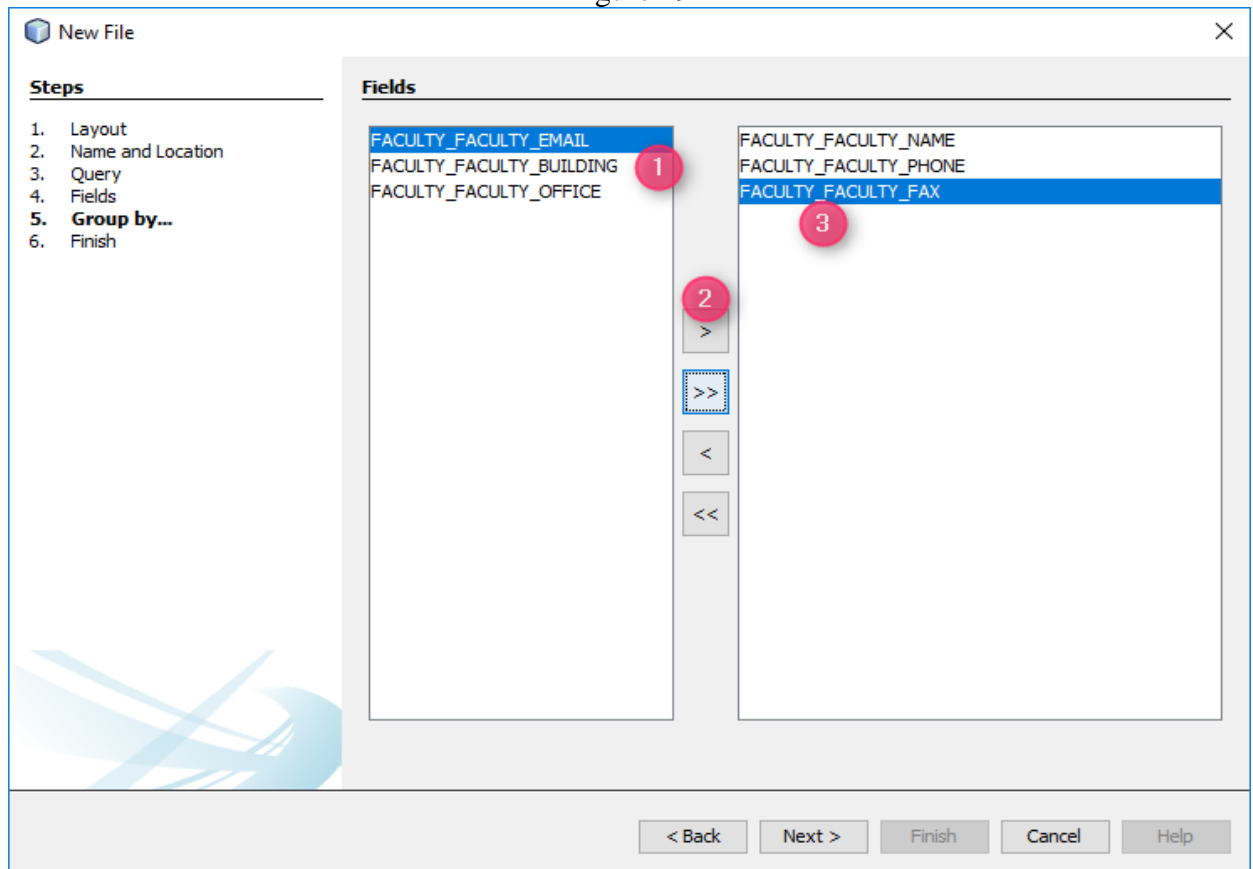


Figure 20

- xii. Click next and Select grouping if any, for now do nothing, click “Next” (Figure 21)

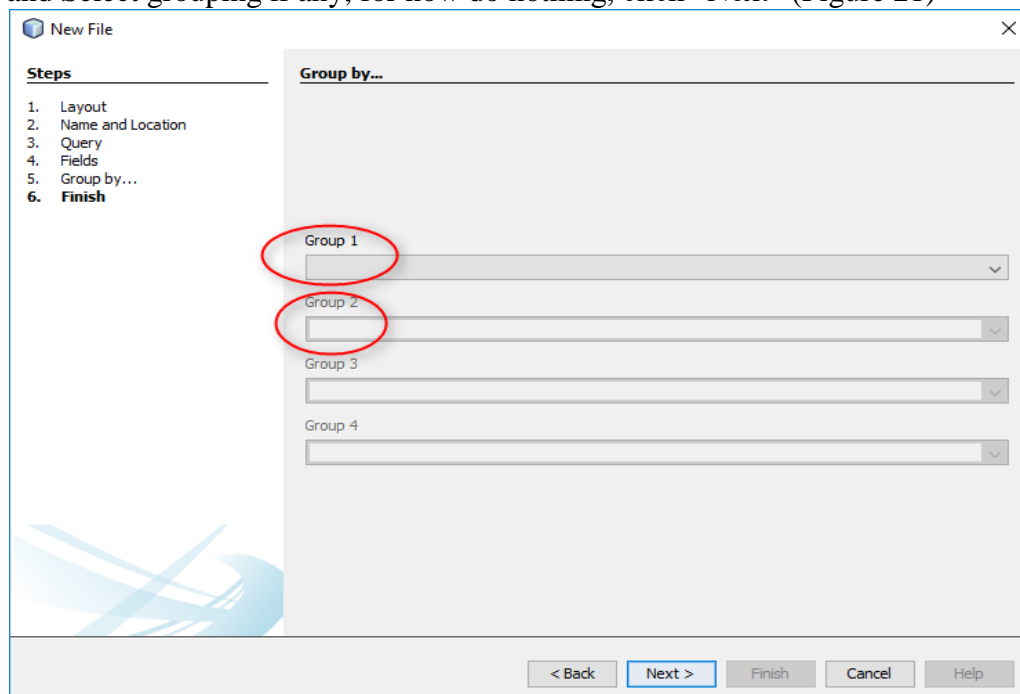


Figure 21

xiii. Finish the wizard, click “Finish” (Figure 22)

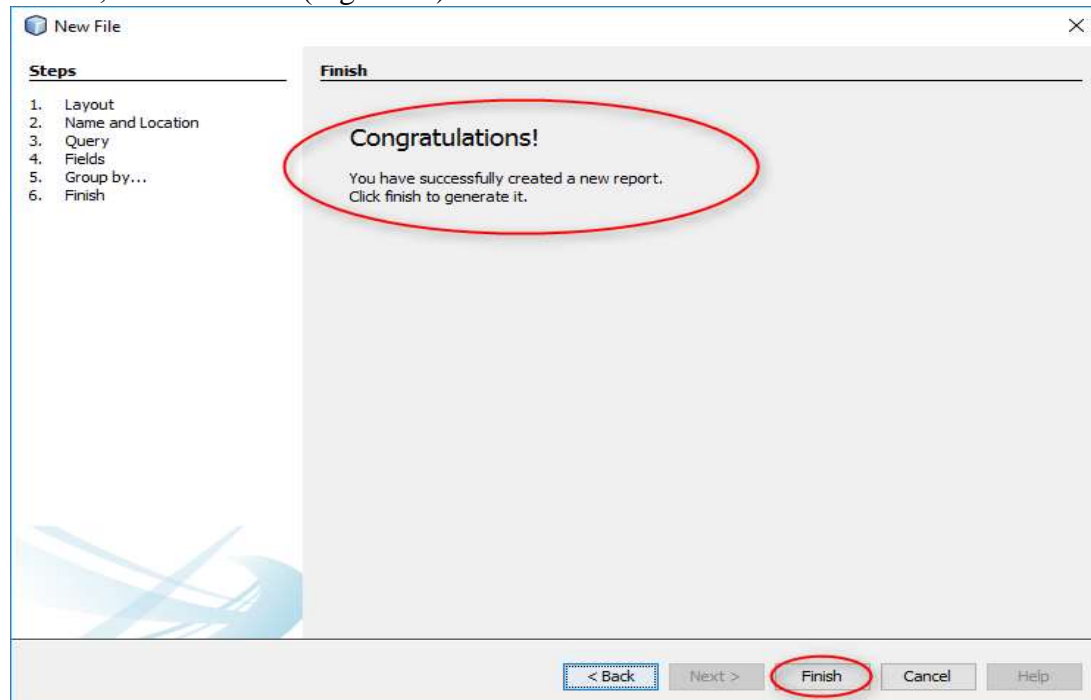


Figure 22

xiv. Design the report, use available iReport tools to design a visually attractive report. (Figure 23)

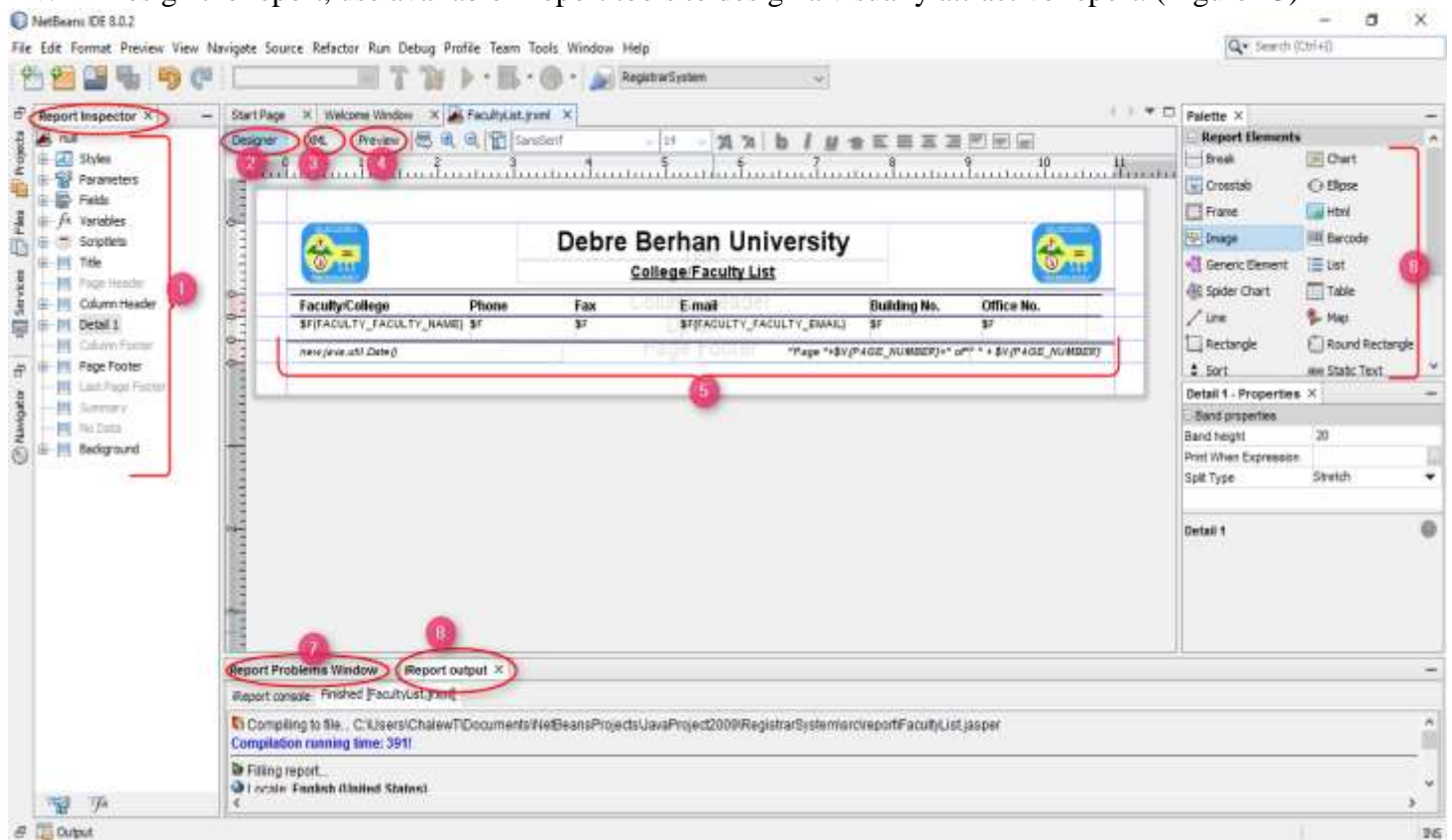
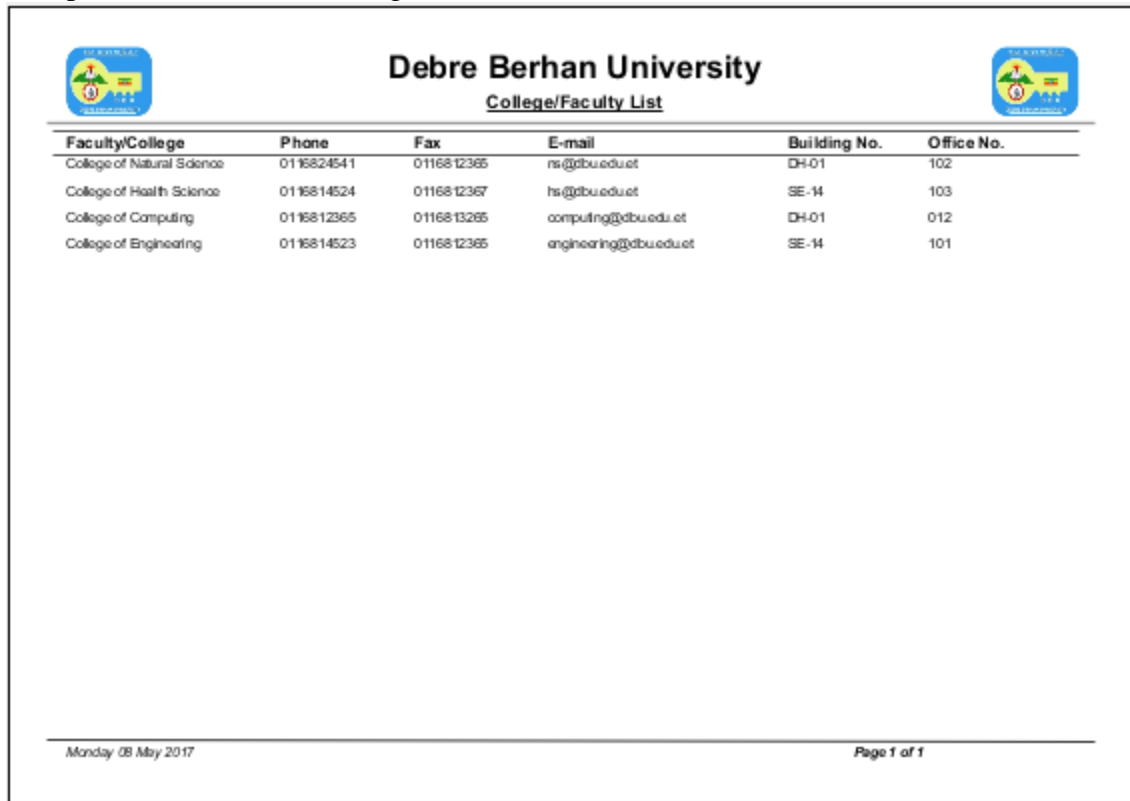


Figure 23

- xv. View the report with Preview tab (Figure 23[4])



The screenshot displays a web page for Debre Berhan University. At the top, the university's name is centered, flanked by its logo on the left and a smaller version of the logo on the right. Below the name is the title 'College/Faculty List'. A table follows, containing contact details for four colleges. The table has six columns: Faculty/College, Phone, Fax, E-mail, Building No., and Office No. The data rows are for the College of Natural Science, College of Health Science, College of Computing, and College of Engineering. At the bottom of the page, there is a footer with the date 'Monday 08 May 2017' on the left and 'Page 1 of 1' on the right.

Faculty/College	Phone	Fax	E-mail	Building No.	Office No.
College of Natural Science	0116824541	0116812365	ns@dbu.edu.et	DH-01	102
College of Health Science	0116814524	0116812367	hs@dbu.edu.et	SE-14	103
College of Computing	0116812365	0116813265	computing@dbu.edu.et	DH-01	012
College of Engineering	0116814523	0116812365	engineering@dbu.edu.et	SE-14	101

Monday 08 May 2017

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Figure 24

5.4.4 Call iReport from a Java App

- i. Import required libraries
 - Select libraries -> click Add jar/Folder
 - JasperSoft libraries
 - Browse the following “.jar” files in
 - C:\Users\username\AppData\Roaming\NetBeans\8.0.2\modules and \ext or C:\Users\username\.netbeans\8.0.2\modules and \ext folder in Window OS
 - It is recommend to copy all the libraries to your project folder first
 - Select the following libraries one by one
 - jasperreports-5.5.0.jar
 - commons-beanutils-1.8.2.jar
 - commons-collections-3.2.1.jar
 - commons-digester-2.1.jar
 - commons-javaflow-20060411.jar
 - commons-logging-1.1.jar
 - groovy-all-2.0.1.jar
 - servlet-api-2.4.jar
 - jdt-compiler-3.1.1.jar
 - iText-2.1.7.js2.jar
 - poi-3.7-20101029.jar

- ii. Call the report from java code
 - Add the following import packages
 - import net.sf.jasperreports.engine.JRException;
 - import net.sf.jasperreports.engine.JasperCompileManager;
 - import net.sf.jasperreports.engine.JasperFillManager;
 - import net.sf.jasperreports.engine.JasperPrint;
 - import net.sf.jasperreports.engine.JasperReport;
 - import net.sf.jasperreports.view.JasperViewer;
 - create a method that call a faculty list jasper report under “FacultyList” form/class

```
private void loadFacultyReport() {
    try {
        Connection conn = DbConnection.getConn();
        String facultyReport = "src\\report\\FacultyList.jrxml";
        JasperReport jspReport = JasperCompileManager.compileReport(facultyReport);
        JasperPrint jspPrint = JasperFillManager.fillReport(jspReport, null, conn);
        JasperViewer vr = new JasperViewer(jspPrint, false);
        vr.setTitle(" Faculty List");
        vr.setVisible(true);    } catch (SQLException | JRException e) {
        JOptionPane.showMessageDialog(this, e.getMessage());
    } catch (Exception e) {
        JOptionPane.showMessageDialog(this, e.getMessage());
    }
}
```

- iii. add a button control (Print, btnPrint) to FacultyList form
- iv. call the method under print button action performed event
private void btnPrintActionPerformed(java.awt.event.ActionEvent evt) {
 loadFacultyReport();
}
- v. run and test

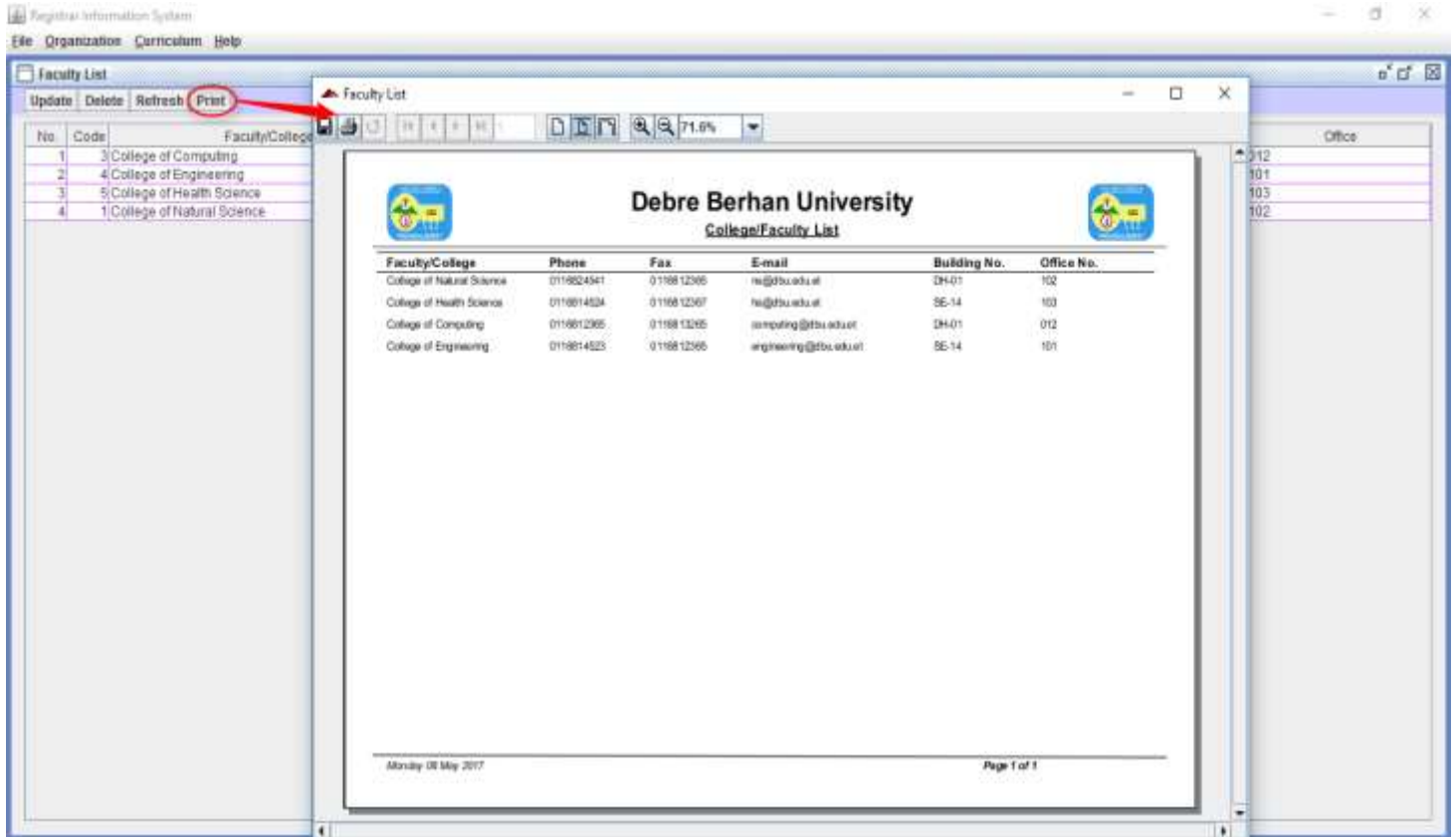


Figure 25

5.4.5 Passing parameters to Jasper Report

- Parameters used to pass
 - dynamic values from the java program to the report
 - Report selection criteria
- To pass parameters
 1. Define array of parameters
 2. Assign the value of java control values to the name of parameters defined in the report
 3. Call the report by passing
 - ✓ Parameter values along with
 - ✓ the report name and
 - ✓ connection string

Design a Curriculum Details report, which list detail information about the curriculum and available course with breakdown under the curriculum.

- i. Add a report called “**CurriculumDetails**” (Follow the steps in (0 Using iReport to Design a Report))
- ii. Design the report to the following ()
 - a. Define parameter (Figure 26[1])
 - b. Add the parameter to the report (Figure 26[2])

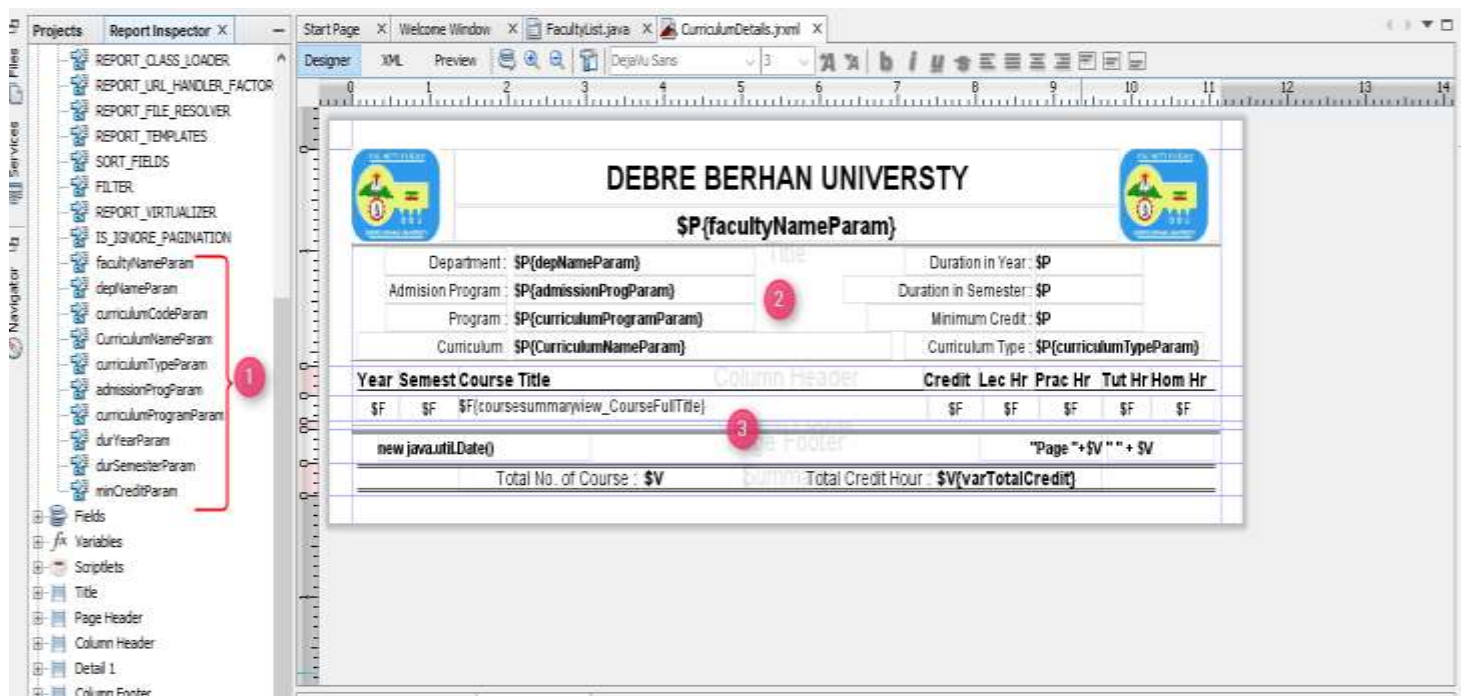


Figure 26

- iii. Create a method called “loadCurriculumReport” which:
 - Define the parameters
 - Pass parameter and
 - Display “CurriculumDetails” jasper report a

```
private void loadCurriculumReport() {
    if (cmbCurriculum.getSelectedIndex() != -1 && cmbProgram.getSelectedIndex() != -1) {
        this.setCursor(Cursor.getPredefinedCursor(Cursor.WAIT_CURSOR));
        try {
            SisComboBoxItem currItem = (SisComboBoxItem) cmbCurriculum.getSelectedItem();
            SisComboBoxItem curriculumBdItem = (SisComboBoxItem) cmbProgram.getSelectedItem();

            Connection conn = DbConnection.getConn();
            // Put values from controls into a parameter map.
            Map currParams = new HashMap<>();
            currParams.put("facultyNameParam", cmbFaculty.getSelectedItem().toString());
            currParams.put("depNameParam", cmbDepartment.getSelectedItem().toString());
            currParams.put("curriculumCodeParam", currItem.getCodeValue());
            currParams.put("CurriculumNameParam", cmbCurriculum.getSelectedItem().toString());
            currParams.put("curriculumTypeParam", cmbCurrType.getSelectedItem().toString());
            currParams.put("admissionProgParam", cmbProgram.getSelectedItem().toString());
            currParams.put("curriculumProgramParam", currItem.getCurrProgram());
            currParams.put("durYearParam", curriculumBdItem.getNoYear());
            currParams.put("durSemesterParam", curriculumBdItem.getNoSemster());
            currParams.put("minCreditParam", currItem.getCurrminCredit());
            // Give the parameters to the report filler.
            String courseReport = "src\\reports\\CurriculumDetails.jrxml";
            JasperReport jspReport = JasperCompileManager.compileReport(courseReport);
            JasperPrint jspPrint = JasperFillManager.fillReport(jspReport, currParams, conn);
            //Display the report
            JasperViewer vr = new JasperViewer(jspPrint, false);
            vr.setTitle(cmbCurriculum.getSelectedItem().toString() + " Curriculum Details");
            vr.setVisible(true);
        } catch (SQLException | JRException e) {
            JOptionPane.showMessageDialog(this, e.getMessage());
        } catch (Exception e) {
            JOptionPane.showMessageDialog(this, e.getMessage());
        }
        this.setCursor(Cursor.getPredefinedCursor(Cursor.DEFAULT_CURSOR));
    }
}
```

- iv. Add `JInternalForm` called “CurriculumList” to your project, design to look the following picture (Figure 27)

Figure 27

- v. Call the method “**loadCurriculumReport**” under action performed event of print (`btnPrintCurriculum`) button control.
- ```
private void btnPrintCurriculumPerformed(java.awt.event.ActionEvent evt) {
 loadCurriculumReport();
}
```
- vi. Run and test  
You should have to get an output similar to the following picture (Figure 28)



Student Information System

File Organization Curriculum Student

Course List

Faculty/College : College of Computing Science  
 Department : Computer Science  
 Curriculum Type : Harmonized  
 Curriculum : Bachelor of Science degree in Computer Science (2013)  
 Admission Program : Regular

Year Semester Course Title

1 1 CoSc1011-Intro  
 1 1 CoSc1013-Fund  
 1 1 CvEt1021-Civic  
 1 1 EEEng1041-Fund  
 1 1 Enla1011-Comm  
 1 1 Math1012-Linear  
 1 2 CoSc1014-Fund  
 1 2 EEEng1042-Dig  
 1 2 Enla1012-Basic  
 1 2 Math1015-App  
 1 2 Phil1024-Intro  
 1 2 Stat1012-Prob  
 2 1 CoSc2041-Comp  
 2 1 CoSc2071-Fund  
 2 1 CoSc2082-Obje  
 2 1 CoSc2083-Data  
 2 1 Math2031-Disce  
 2 1 Math2081-Numer  
 2 1 CoSc2042-Oper  
 2 1 CoSc2043-Micro  
 2 2 CoSc2061-Data  
 2 2 CoSc2072-Adv  
 2 2 CoSc2084-Adv  
 2 2 CoSc2085-Wire

Bachelor of Science degree in Computer Science (2013) Curriculum Details

DEBRE BERHAN UNIVERSITY  
 College of Computing Science

Department : Computer Science  
 Admission Program : Regular  
 Program : Degree  
 Curriculum Nomenclature : Bachelor of Science degree in Computer Science (2013)  
 Duration in Year : 4  
 Duration in Semester : 8  
 Minimum Credit : 140  
 Curriculum Type : Harmonized Modular

| Year | Semest | Course Title                                         | Credit | Lec Hr | Prac Hr | Tut Hr | Hom Hr |
|------|--------|------------------------------------------------------|--------|--------|---------|--------|--------|
| 1    | 1      | CoSc1011-Introduction to Computer Science            | 5      | 2      | 3       | 0      | 5      |
| 1    | 1      | CoSc1013-Fundamentals of Programming I               | 5      | 2      | 3       | 1      | 4      |
| 1    | 1      | CvEt1021-Civics and Ethical Education                | 5      | 2      | 0       | 3      | 5      |
| 1    | 1      | EEEng1041-Fundamentals of Electricity and Electronic | 5      | 2      | 3       | 1      | 4      |
| 1    | 1      | Enla1011-Communicative English Skills                | 5      | 2      | 0       | 3      | 5      |
| 1    | 1      | Math1012-Linear Algebra                              | 5      | 3      | 0       | 1      | 6      |
| 1    | 2      | CoSc1014-Fundamentals of Programming II              | 5      | 2      | 3       | 1      | 4      |
| 1    | 2      | EEEng1042-Digital Electronics                        | 5      | 2      | 3       | 0      | 5      |
| 1    | 2      | Enla1012-Basic Writing Skills                        | 5      | 2      | 2       | 1      | 5      |
| 1    | 2      | Math1015-Applied Mathematics for Computer Science    | 6      | 4      | 0       | 2      | 6      |
| 1    | 2      | Phil1024-Introduction to Logic (Reasoning Skill)     | 5      | 3      | 0       | 0      | 7      |
| 1    | 2      | Stat1012-Probability and Statistics                  | 5      | 3      | 0       | 2      | 5      |
| 2    | 1      | CoSc2041-Computer organization and architecture      | 5      | 3      | 0       | 2      | 5      |
| 2    | 1      | CoSc2071-Fundamentals of Database System             | 6      | 3      | 3       | 1      | 5      |
| 2    | 1      | CoSc2082-Object Oriented Programming                 | 6      | 3      | 3       | 1      | 5      |
| 2    | 1      | CoSc2083-Data Structures and Algorithms              | 6      | 3      | 3       | 1      | 5      |
| 2    | 1      | Math2031-Discrete Mathematics and Combinatorics      | 5      | 3      | 0       | 2      | 5      |
| 2    | 1      | Math2081-Numerical Analysis                          | 6      | 3      | 3       | 0      | 6      |
| 2    | 2      | CoSc2042-Operating System                            | 6      | 3      | 3       | 1      | 5      |

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User : chalewt(Administrator)

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Total Credit : 241

Figure 28 Curriculum Detail Report output

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