In this example is shown a usage of the database containing list of books. The database name is "MYTEST" and has following tables:

```
AUTHOR:
    IDAUTHOR INTEGER NOT NULL GENERATED BY DEFAULT AS IDENTITY,
    AUTHOR VARCHAR(100) NOT NULL, PRIMARY KEY(IDAUTHOR), UNIQUE (AUTHOR)

TITLE:
  IDTITLE INTEGER NOT NULL GENERATED BY DEFAULT AS IDENTITY,
    TITLE VARCHAR(100) NOT NULL, ISSUED INTEGER, ISBN VARCHAR(10) NOT NULL,
    PRIMARY KEY(IDTITLE), UNIQUE (TITLE, ISBN)

TITLE_AUTHOR:
  IDTITLE_AUTHOR INTEGER NOT NULL GENERATED BY DEFAULT AS IDENTITY,
    IDAUTHOR INTEGER NOT NULL, IDTITLE INTEGER NOT NULL,
    PRIMARY KEY(IDTITLE_AUTHOR),
    UNIQUE (IDAUTHOR, IDTITLE),
    FOREIGN KEY (IDAUTHOR) REFERENCES MYTEST.AUTHOR(IDAUTHOR),
    FOREIGN KEY (IDTITLE) REFERENCES MYTEST.TITLE(IDTITLE)
```

1. Read data from database.

X-Definition (file DBRead.xdef):

```
<xd:def xmlns:xd="http://www.syntea.cz/xdef/3.1" xd:name="inventory" >
  <xd:declaration>
    external Service service;
    Statement statement = service.prepareStatement(
      "SELECT TITLE,ISBN FROM MYTEST.TITLE ORDER BY TITLE ASC");
  </xd:declaration>

  <Inventory xd:script="">
    <Book xd:script="occurs *; create statement.query()" isbn="int()">
     <Title> string();</Title>
    </Book>
  </Inventory>
</xd:def>
```

The Java program (file DBRead.java):

```
import cz.syntea.common.xml.KXmlUtils;
import cz.syntea.xd.XDDocument;
import cz.syntea.xd.XDFactory;
import cz.syntea.xd.XDPool;
import org.w3c.dom.Element;

/** Read data from database.*/
public class DBRead {

        public static void main(String[] args) {
                //Generate XDPool
                XDPool xp = XDFactory.genXDPool(System.getProperties(),"DBread.xdef");

                // Create XDDocument
                XDDocument xd = xp.createXDDocument();

                // Create database connection as Service
                String url = "jdbc:derby://localhost:1527/sample;";
                String user = "app";
                String password = "app";
                XDService service = XDFactory.createSQLService(url, user, password);
                // Set external variable XDDocument
                xd.setVariable("service", service); //set external variable to the X-definition

                // Construct element from database
                Element el = xd.xcreate(null, "Inventory", null); //invoke construction mode

                // Print created XML data
                System.out.println(KXmlUtils.nodeToString(el, true));
        }
```

}

2. Insert data

Input XML data (file DBInsert.xml):

```
<Books>
  <Book issued='2008' isbn='12345678' title='The Last Theorem'>
    <Author>Arthur C. Clarke</Author>
  </Book>
  <Book issued='1968' isbn='234567819' title='2001: A Space Odyssey'>
    <Author>Arthur C. Clarke</Author>
  </Book>
  <Book title='Bible' isbn='9345678199'/>
  <Book issued='2007' isbn='8345678191' title='The X-definition 3.1'>
    <Author>Václav Trojan</Author>
    <Author>Jindřich Kocman</Author>
    <Author>Jiří Kamenický</Author>
  </Book>
  <Book title='Koran' isbn='9345478191'/>
</Books>
```

The X-definition designed to insert the XML data to database (file DBInsert.xdef):

```
<xd:def xmlns:xd="http://www.syntea.cz/xdef/3.1" xd:root="Books|Book">
  <xd:declaration>
    external Service service;
    int inserted = 0;
    boolean ignored = false;
    Statement isAuthor = service.prepareStatement(
      "SELECT AUTHOR FROM MYTEST.AUTHOR WHERE MYTEST.AUTHOR.AUTHOR = ?");
    Statement isTitle = service.prepareStatement(
      "SELECT TITLE FROM MYTEST.TITLE WHERE MYTEST.TITLE.TITLE = ?");
    Statement insertAuthor = service.prepareStatement(
      "INSERT INTO MYTEST.AUTHOR(AUTHOR) VALUES (?)");
    Statement insertTitle = service.prepareStatement(
      "INSERT INTO MYTEST.TITLE(TITLE,ISBN,ISSUED) VALUES (?,?,?)");
    Statement insertTitleAuthor = service.prepareStatement(
      "INSERT INTO MYTEST.TITLE_AUTHOR(IDAUTHOR,IDTITLE)
         VALUES ((SELECT IDAUTHOR FROM MYTEST.AUTHOR WHERE AUTHOR=?),
          (SELECT IDTITLE FROM MYTEST.TITLE WHERE TITLE=?))");
   </xd:declaration>
 <Books>
  <Book xd:script="*;
              onStartElement {
                  if (ignored = isTitle.hasItem(toString(@title))) {
                    error('Book \'' + @title + '\' already exists');
                  } else {
                    insertTitle.execute(toString(@title), toString(@isbn), toString(@issued));
                    inserted++;
                  }
              };"
     title="string"
     isbn="regex('\\d{8,10}')"
     issued="optional gYear()">
     <Author xd:script="occurs *">
        optional string;
        finally if (!ignored) {
          String s = getText();
          if (!isAuthor.hasItem(s)) {
            insertAuthor.execute(s); /*new author*/
          }
          insertTitleAuthor.execute(s, xpath("../@title").toString());
        }
     </Author>
  </Book>
 </Books>

</xd:def>
```

The Java program (file DBInsert.java**):**

```
import cz.syntea.common.sys.ArrayReporter;
import cz.syntea.xd.XDDocument;
import cz.syntea.xd.XDFactory;
import cz.syntea.xd.XDPool;
import cz.syntea.xd.XDService;

/** Insert books to database (explicite statements). */
public class DBInsert {

        public static void main(String[] args)  {

                // Generate XDPool
                XDPool xp = XDFactory.genXDPool(System.getProperties(),"DBInsert.xdef");

                // Create XDDocument
                XDDocument xd = xp.createXDDocument();

                // Create database connection as Service
                String url = "jdbc:derby://localhost:1527/sample;";
                String user = "app";
                String password = "app";
                XDService service = XDFactory.createSQLService(url, user, password);

                // Set external variable with database connection to XDDocument
                xd.setVariable("service", service); //set external variable to the X-definition

                // Execute processing of XML data with XDefinition
                ArrayReporter reporter = new ArrayReporter(); //prepare reporter
                xd.xparse("ExampleDBInsert.xml", reporter); //process data
                //close database connection
                service.close();

                // Get number of inserted books from XDDocument
                int num = xd.getVariable("inserted").intValue();
                // Print number of inseted books
                System.out.println("Inserted " + num + " books");
                if (reporter.errors()) {
                        reporter.printReports(System.err);
                }
    }

}
```