BioNumerics Tutorial:

Importing MLVA repeat numbers from a text file

1 Aims

This tutorial shows how to import MLVA repeat numbers from a text file as character data in a BioNumerics database. It illustrates the use of *import templates* in the software. Import templates specify from which external field – in a file or a database – information should be imported into which information field in BioNumerics (e.g. an entry field, character value or character experiment field).

2 Example data

The example text file from which we will import data in this tutorial contains MLVA repeat numbers for 4 loci for about 500 strains and can be downloaded from http://www.applied-maths.com/download/sample-data.

1. Open the file `MLVA repeat numbers.txt` to examine the data that will be imported (see Figure 1).

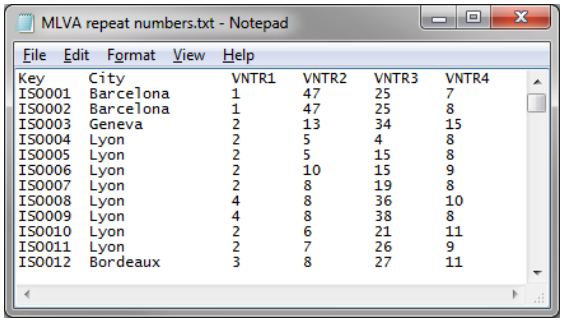

Figure 1: Text file with MLVA repeat numbers.

The text file contains for 500 isolates following information: a unique identifier (”Key”), the city where the strains originate from, and MLVA repeat numbers for 4 loci.

2. Close the text file again.

Using the *MLVA plugin*, MLVA copy numbers can be determined in BioNumerics based on fingerprints, generated on capillary electrophoresis systems.

3 Creating a new character type

1. Create a new database (see tutorial ”Creating a new database”) or open an existing database.

Since we will be importing the repeat numbers as character data, we will first create a character type to hold this data. The steps below can be skipped if a suitable character type is already present in the database.

2. In the *Main* window, click on  in the toolbar of the *Experiment types* panel and select ***Character type*** from the list. Press <***OK***>.

The *New character type* wizard prompts you to enter a name for the new character type.

3. Enter a name, for example “MLVA” and press <***Next***>.

In the next step of the wizard, the choice is offered between ***Numerical values*** and ***Binary data***.

4. Choose ***Numerical values***.

5. Since we only want to use integer values, leave the number of decimal digits unaltered (zero).

After pressing <***Next***> again, the wizard asks if the character type has an open (***Yes***) or closed (***No***) character set.

6. Answer ***No*** and set the ***Number of rows*** and ***Number of columns*** to zero.

7. Press the <***Finish***> button to complete the setup of the new character type.

The *Experiment types* panel now lists the new character type **MLVA**.

4 Import procedure

1. Select ***File*** > ***Import...*** ( , **Ctrl+I**) to open the *Import* dialog box.

2. Choose the option ***Import fields and characters (text file)*** under the ***Character type data*** item in the tree and press <***Import***> (see Figure 2).

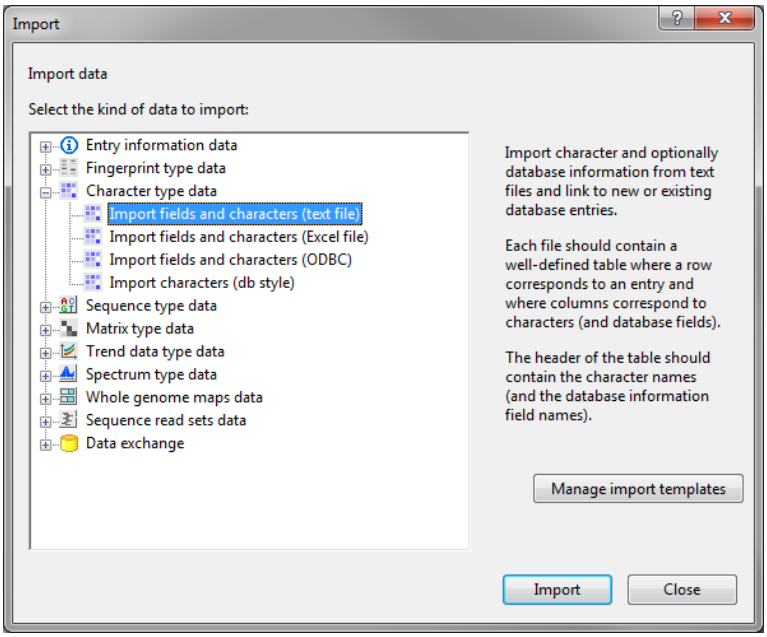

Figure 2: The *Import* dialog box.

3. Press <***Browse***> and browse for the downloaded `MLVA repeat numbers.txt` file (see Figure 3). Next, press <***Open***> and press <***Next***>.

As this is the first time we import character data from a text file into the database, we need to create a new import template by specifying ***Import rules***.

4. Select ”Key” in the list and click <***Edit destination***> or simply double-click on ”Key”. Select ”Key” as the BioNumerics destination field in the *Edit data destination* dialog box and press <***OK***>.

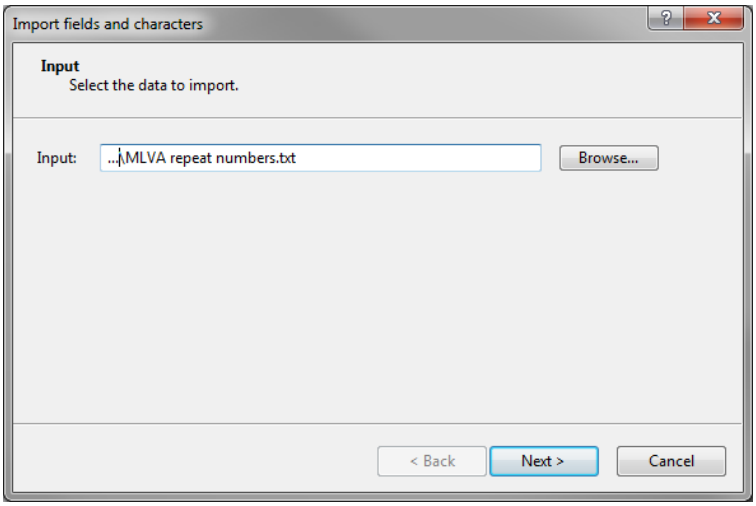

Figure 3: Select text file.

5. Select ”City” in the list and click <***Edit destination***> or simply double-click on ”City”.

Since there is no field present yet in the database to hold this information, the database information field needs to be created first.

6. Select ”<Create new>” under ”Entry info field” and press <***OK***>.

7. In the dialog box that appears, press <***OK***> to accept the suggested name (by default the same of the corresponding column in the text file) and confirm this modification to the database with <***Yes***>.

8. Make a multiple selection for all four loci. Do this by selecting ”VNTR1” and while holding the **Shift**-key, click on ”VNTR4”. Press <***Edit destination***>, select the character type ”MLVA” as destination under ”Character value” and click <***OK***>.

9. Press <***OK***> and then <***Yes***> to confirm the creation of new characters.

The grid panel is updated (see Figure 4).

10. Press <***Preview***> to see what you are about to import.

11. Press the <***Close***> button to close the preview.

12. Press <***Next***> to proceed to the *Import links* dialog box.

13. Check ”Key” under ***Import links*** and press <***Finish***>.

The import template needs to be saved to be able to use it again later on.

14. Enter a ***Name*** for the import template (e.g. “MLVA text file”) and optionally a ***Description***. Next, press <***OK***>.

15. In the *Import template* wizard page, the new template is added and is automatically selected. Click <***Next***>.

In case there are no entries present with the same key as in the external file, the *Database links* wizard page will indicate that 500 new entries will be created during import (see Figure 5).

16. Press <***Finish***> to start the actual import. The progress of the import is shown while database information is added to the BioNumerics database.

The entries are displayed in the *Database entries* panel and all entries are automatically selected (see Figure 6). The character data is stored in the character type **MLVA**.

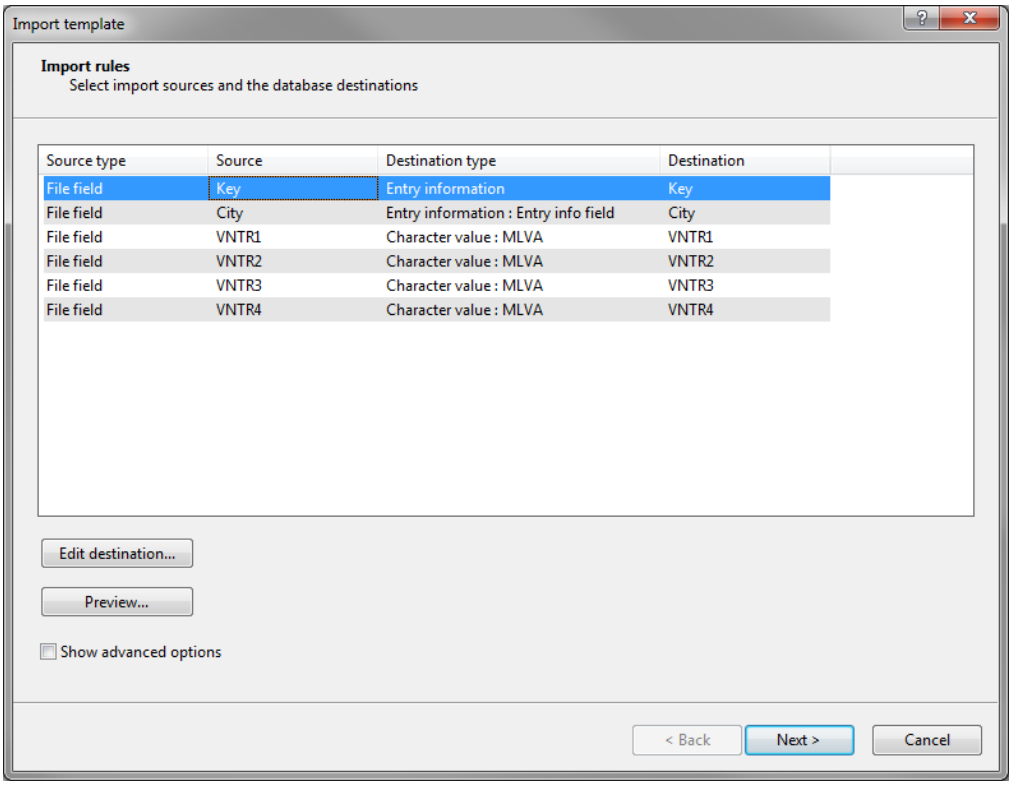

Figure 4: The import rules.

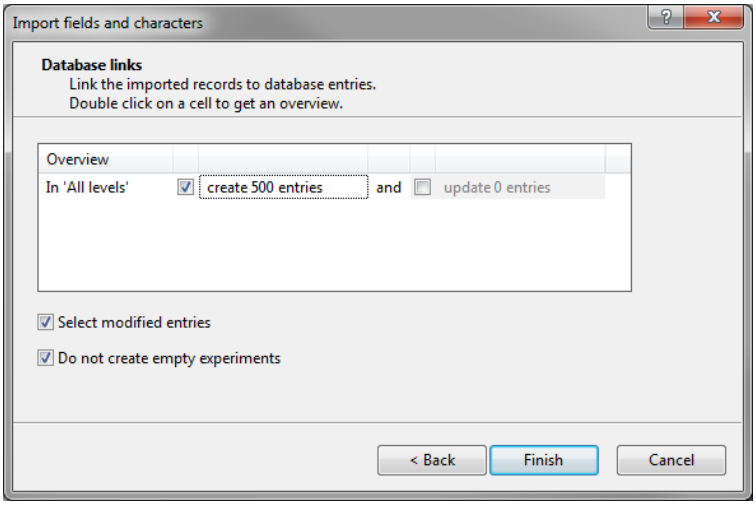

Figure 5: Create 500 new entries.

17. To view the values in a list, double-click on the experiment **MLVA** in the *Experiment types* panel, select ***Settings*** > ***General settings...*** (), select the *Experiment card tab* and change the representation to ***List***. Close the two windows.

18. Click on a green colored dot in the *Experiment presence* panel to open the experiment card for an entry.

The imported MLVA repeat numbers are displayed in the experiment card next to the corresponding locus name (see Figure 7).

19. Close the experiment card by clicking in the left upper corner of the card.

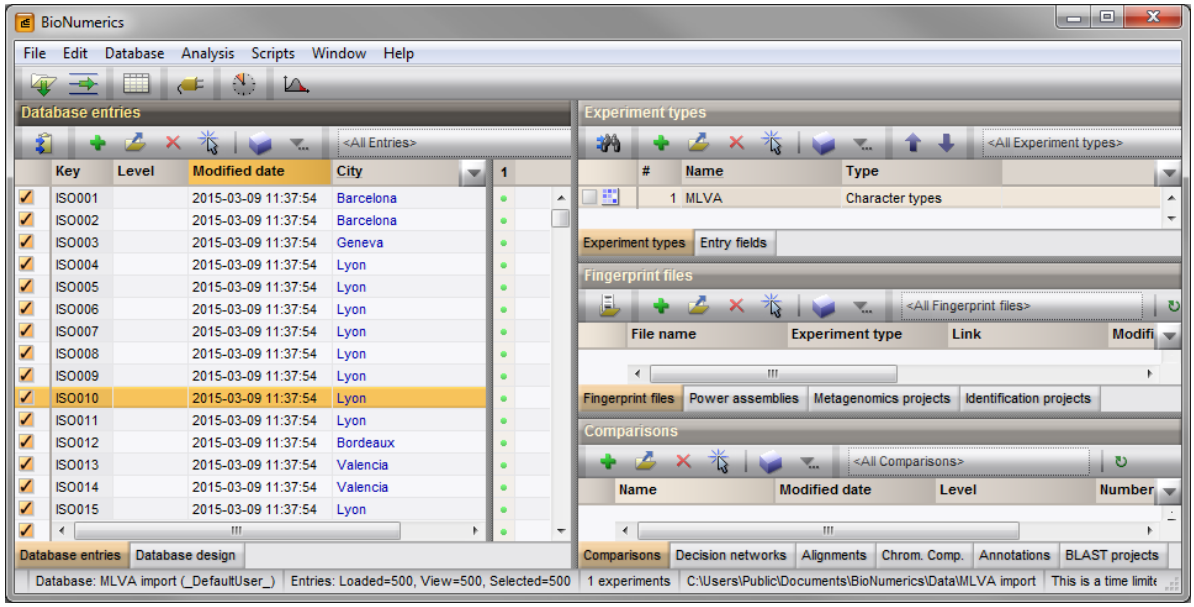

Figure 6: The *Main* window after import of the data.

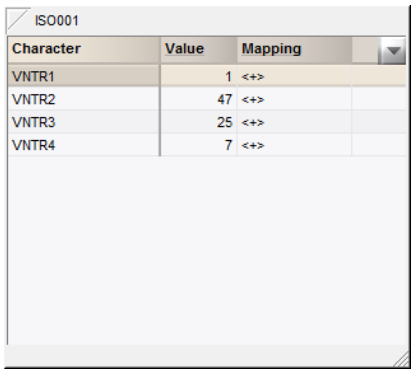

Figure 7: The experiment card.