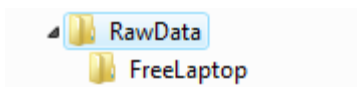


1. The first step for this deliverable is to stage the raw data. We will use the raw data used in the first deliverable, the 36-subject Laptop Free data.
 - a. Navigate to the 'features' directory on your computer under your 'newBAS' project directory in your file system.
 - b. You should see approximately 16 files.
 - c. Delete all files in the 'features' directory.
 - d. Navigate to the 'RawData' directory on your computer under your 'newBAS' project directory in your file system.
 - e. You should see 14 subdirectories and a demographics file in this directory:

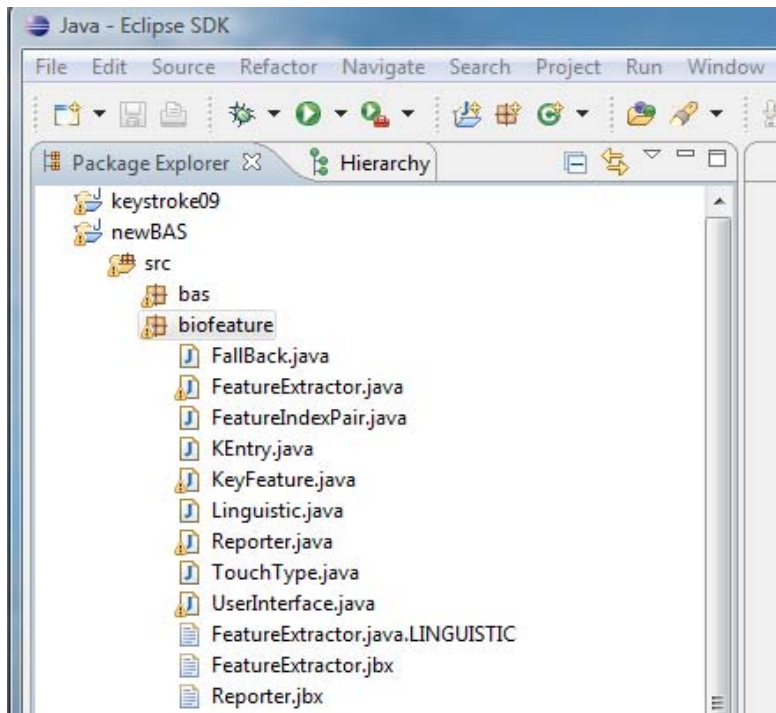
Name	Date modified	Type	Size
evelinU	10/5/2009 10:46 PM	File Folder	
FableDesktopWeek0	10/5/2009 10:46 PM	File Folder	
FableDesktopWeek2	10/5/2009 10:46 PM	File Folder	
FableDesktopWeek4	10/5/2009 10:46 PM	File Folder	
FableLaptopWeek0	10/5/2009 10:46 PM	File Folder	
FableLaptopWeek2	10/5/2009 10:46 PM	File Folder	
FableLaptopWeek4	10/5/2009 10:46 PM	File Folder	
FreeDesktopWeek0	10/5/2009 10:46 PM	File Folder	
FreeDesktopWeek2	10/5/2009 10:46 PM	File Folder	
FreeDesktopWeek4	10/5/2009 10:46 PM	File Folder	
FreeLaptopWeek0	10/5/2009 10:46 PM	File Folder	
FreeLaptopWeek2	10/5/2009 10:46 PM	File Folder	
FreeLaptopWeek4	10/5/2009 10:46 PM	File Folder	
test subjects	10/5/2009 10:46 PM	File Folder	
demographics	10/5/2009 10:46 PM	Text Document	9 KB

- f. You should delete everything from this directory so that the RawData directory is empty.
- g. Download the FreeLaptop data files and demographics file from the class web site and copy them into a directory beneath RawData called FreeLaptop in the RawData directory you just emptied.

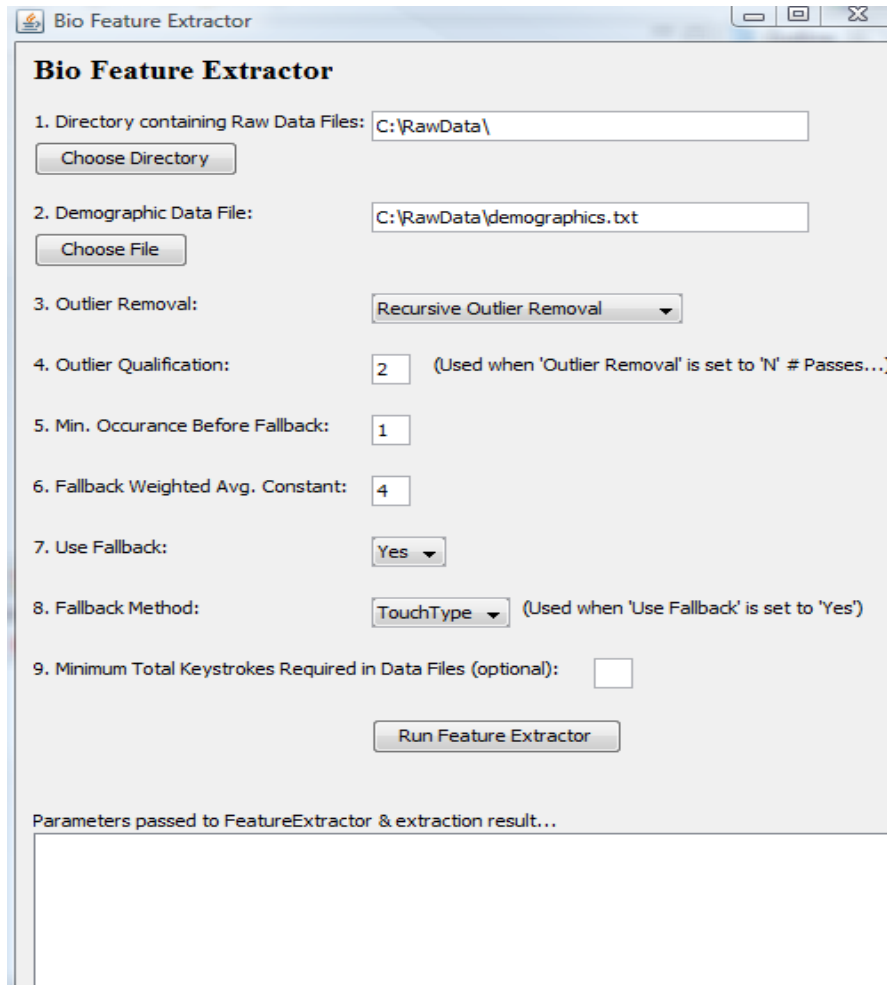


RawData should contain the demographics file and FreeLaptop should contain 180 files. All data files should be dated 11/16/2007 @8:36PM.

2. Start Eclipse and navigate to the newBAS package that you used in Deliverable 3. Highlight the biofeature package.



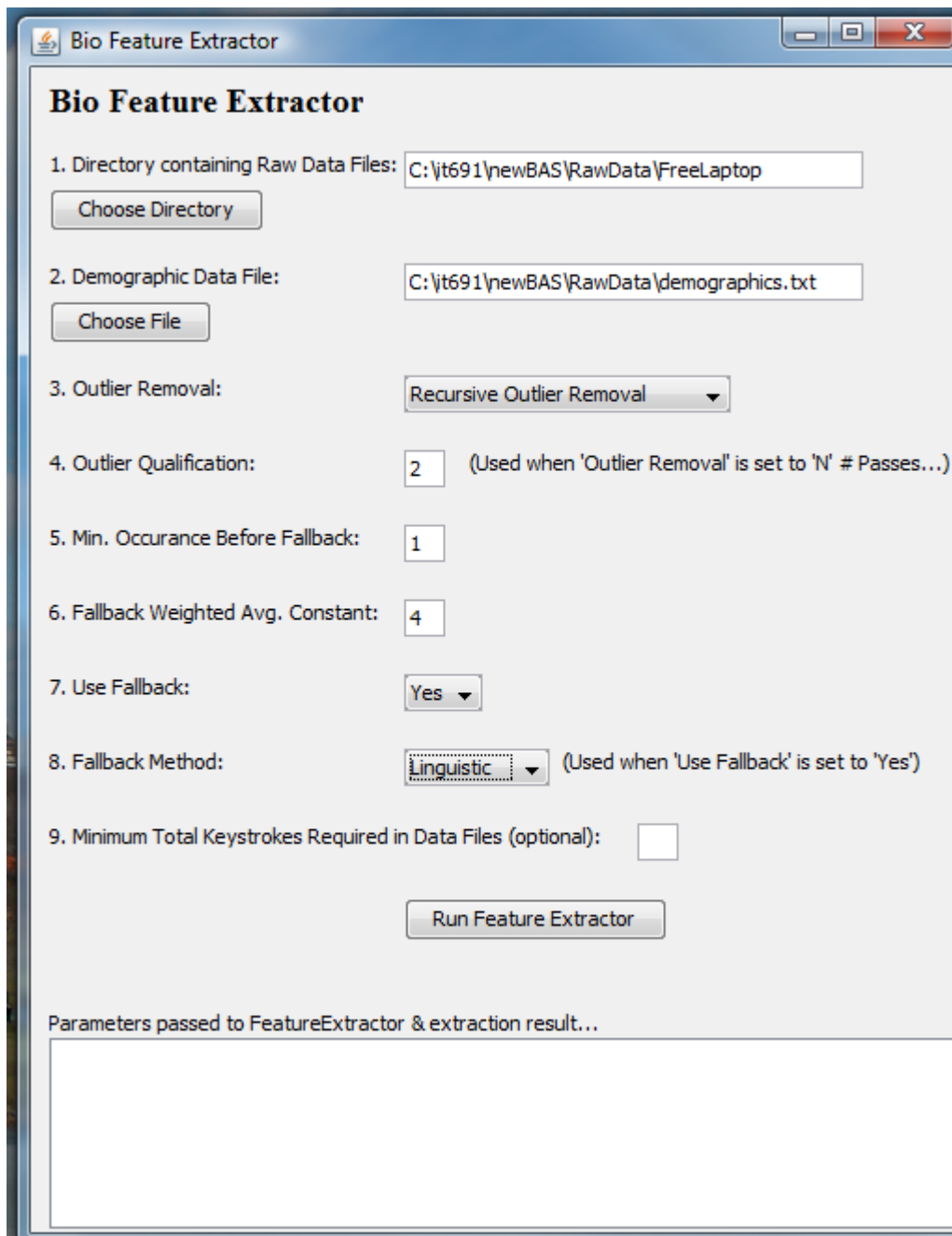
3. Highlight UserInterface.java and run it as a java application. The following screen should appear:



4. Make the following selections once the Bio Feature Extractor loads. The following #'s match the numbers on the Bio Feature Extractor screen:

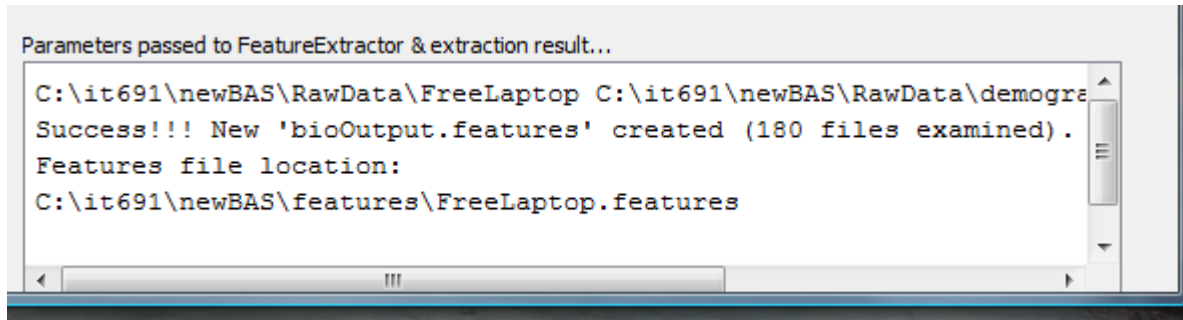
1. Enter the path to your FreeLaptop raw data from the previous step. In this example it is c:\it691\newBas\RawData\FreeLaptop
2. Enter the path to the Demographic data file. In this example it is c:\it691\newBas\RawData\demographics.txt
8. Change the Fallback Method from the default of 'TouchType' to 'Linguistic'.

The following graphic illustrates the results of this step:



9. Run the Bio Feature Extractor by pressing the Run button near the bottom of the Bio Feature Extractor screen.

The bottom of the screen should display the following result. This should take less than one or two minutes to run:



```
Parameters passed to FeatureExtractor & extraction result...
C:\it691\newBAS\RawData\FreeLaptop C:\it691\newBAS\RawData\demogra
Success!!! New 'bioOutput.features' created (180 files examined).
Features file location:
C:\it691\newBAS\features\FreeLaptop.features
```

Troubleshooting tips for this step:

If you did not specify a valid directory, you will receive an error message similar to:

```
Failure: Param 1 directory does not exist...
```

If the demographics file is missing, you will receive an error message similar to:

```
Failure: Param 2 file does not exist...
```

If you did not populate the RawData directory with the 180 files, you will receive an error message similar to:

```
C:\it691\newBAS\RawData\FreeLaptop C:\it691\newBAS\RawData\demogra
Failure: No Raw Data files found in "C:\it691\newBAS\RawData\FreeL
```

If your 'FreeLaptop' features file is empty after processing, verify to make sure you did not leave a copy of the demographics.txt file in with the raw data!

5. Using a text editor with word wrap turned off, you must split the feature file into two parts, one for testing and one for training.
 - a. Copy the FreeLaptop.features file to keystroke-traindata2.txt.
 - b. Rename the FreeLaptop.features file to keystroke-testdata2.txt.

- c. Open the keystroke-testdata2.txt file. Change line 2 from 180 to 90.

```
-----
Keystroke biometric data, Laptop/Free, created 10/31/2009
180
```

- d. The count starts on line 3 with the first data row. Row 93 starts with a new subject and begins the second half of the data file. In this file, KATHLEEN VILLANI begins the second half of the data. Remove rows 93 through row 182, the end of file. The file header and start of data should look like this:

```
-----
Keystroke biometric data, Laptop/Free, created 10/31/2009
90
ANCEY VARGHESE/Female/20 - 29, Right, LAPTOP, FREETEXT7 1, 230, 0.0
ANCEY VARGHESE/Female/20 - 29, Right, LAPTOP, FREETEXT1 2, 230, 0.0
ANCEY VARGHESE/Female/20 - 29, Right, LAPTOP, FREETEXT1 2, 230, 0.0
ANCEY VARGHESE/Female/20 - 29, Right, LAPTOP, FREETEXT1 4, 230, 0.0
ANCEY VARGHESE/Female/20 - 29, Right, LAPTOP, FREETEXT1 4, 230, 0.0
ANNIE GRENCI/Female/30 - 39, Right, LAPTOP, FREETEXT4 1, 230, 0.0
ANNIE GRENCI/Female/30 - 39, Right, LAPTOP, FREETEXT2 2, 230, 0.0
ANNIE GRENCI/Female/30 - 39, Right, LAPTOP, FREETEXT2 2, 230, 0.0
```

- e. Open the keystroke-train2.txt file. Change line 2 from 180 to 90.
- f. Remove rows from row 3 to row 92. When done, the file header and start of data should look like this:

```
-----
Keystroke biometric data, Laptop/Free, created 10/31/2009
90
KATHLEEN VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT7 1, 230, 0.0
KATHLEEN VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT7 1, 230, 0.0
KATHLEEN VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT7 1, 230, 0.0
KATHLEEN VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT7 1, 230, 0.0
KATHLEEN VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT7 1, 230, 0.0
LAUREN BOYLAN/Female/40 - 49, Right, LAPTOP, FREETEXT5 1, 230, 0.80
LAUREN BOYLAN/Female/40 - 49, Right, LAPTOP, FREETEXT5 1, 230, 0.79
LAUREN BOYLAN/Female/40 - 49, Right, LAPTOP, FREETEXT5 1, 230, 0.79
LAUREN BOYLAN/Female/40 - 49, Right, LAPTOP, FREETEXT5 1, 230, 0.89
LAUREN BOYLAN/Female/40 - 49, Right, LAPTOP, FREETEXT5 1, 230, 0.80
LAURIE VILLANI/Female/50 - 59, Right, LAPTOP, FREETEXT1 1, 230, 0.0
```

- g. Using the test and train files you created, rerun deliverable 1 using the deliverable 1 BAS program. This time, replace the original test and train keystroke-test.txt and keystroke-train.txt with keystroke-test2.txt and keystroke-train2.txt.

Be sure to copy the test/train data files to a path you will remember. You will need to select this path when picking the test/train files in BAS.

6. Compare your result:

The screenshot shows a window titled 'BAS Result Window' with a close button. The main content is a table titled 'Result' with the following data:

Biometric	Test	Test Sizes	Train	Train Sizes	FRR	FAR	Performance	Test Subject...	Train Subjec...
Keystroke	LAPTOP/FR...	180-3825	LAPTOP/FR...	180-3825	10.00% (18/...	3.29% (126/...	96.40% (38...	18 5.00	18 5.00