

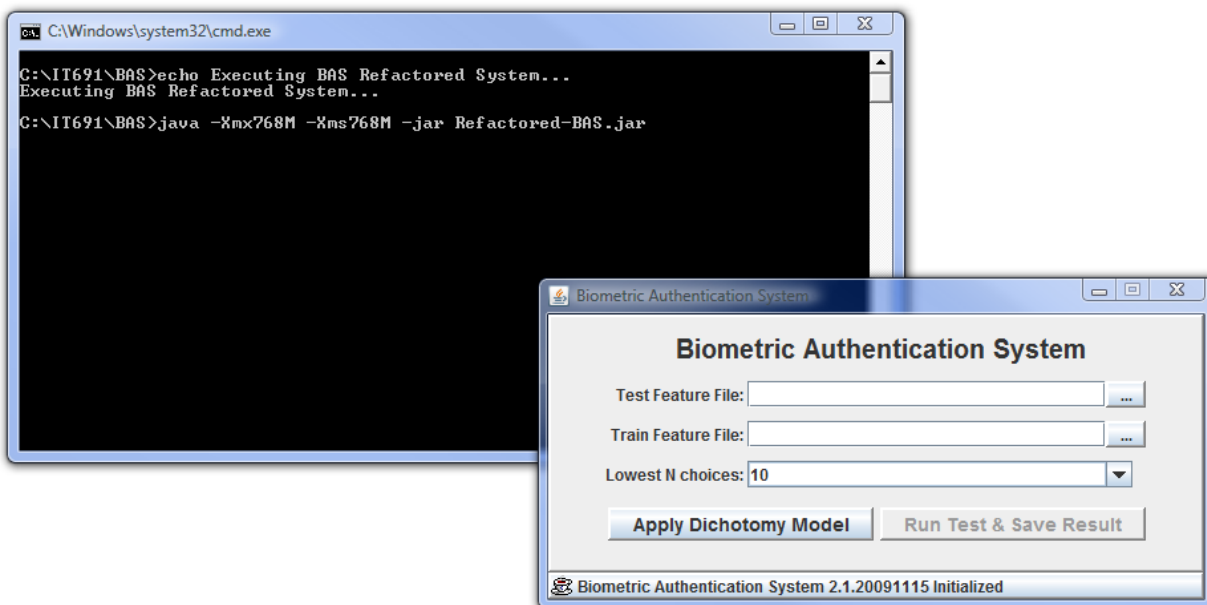
Step 1: Install the Standalone BAS program. Download and extract the files from <http://utopia.csis.pace.edu/cs691/2010-2011/team4/Fall2010/> "Refactored-BAS.zip" to a directory on your local disk. The instructions in this guide assume that you are using c:\it691\BAS on a machine running a Microsoft Windows operating system, Windows XP or later with at least 1 GB of RAM.

After extracting the files, you should have in the directory:

- Calculator.bat
- Refactored-BAS.bat
- Refactored-BAS.jar

Step 2: Launch BAS

Run the Refactored-BAS.bat script from Windows Explorer or the command prompt. The following screen should display if you launched BAS successfully:



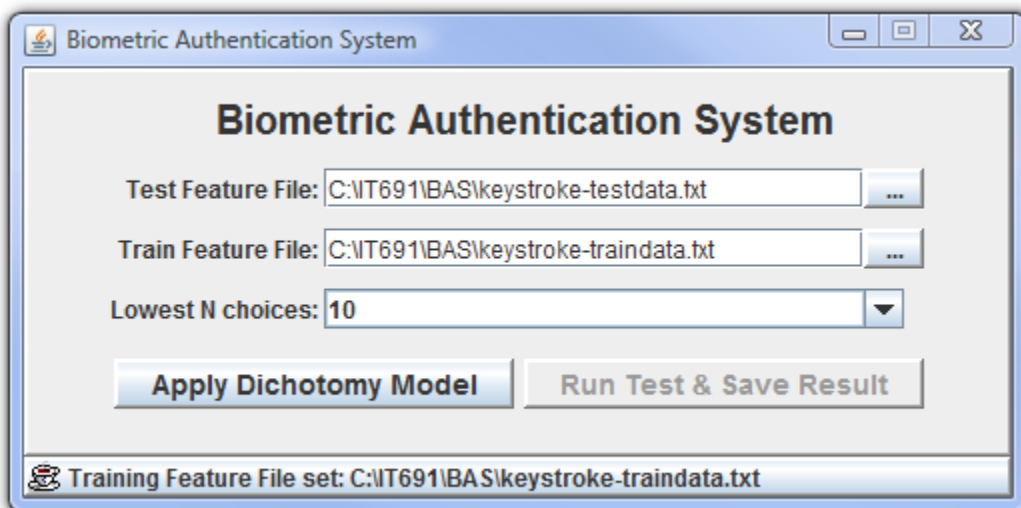
The command window can be minimized if desired, but must not be closed. Information messages will display in the command window.

Step 3: Select Initial Settings

Testing and Training data are provided. For this deliverable, use the provided data files. They are readable in any text editor. When viewing the file, it is recommended that line wrap is disabled so that the information is readable.

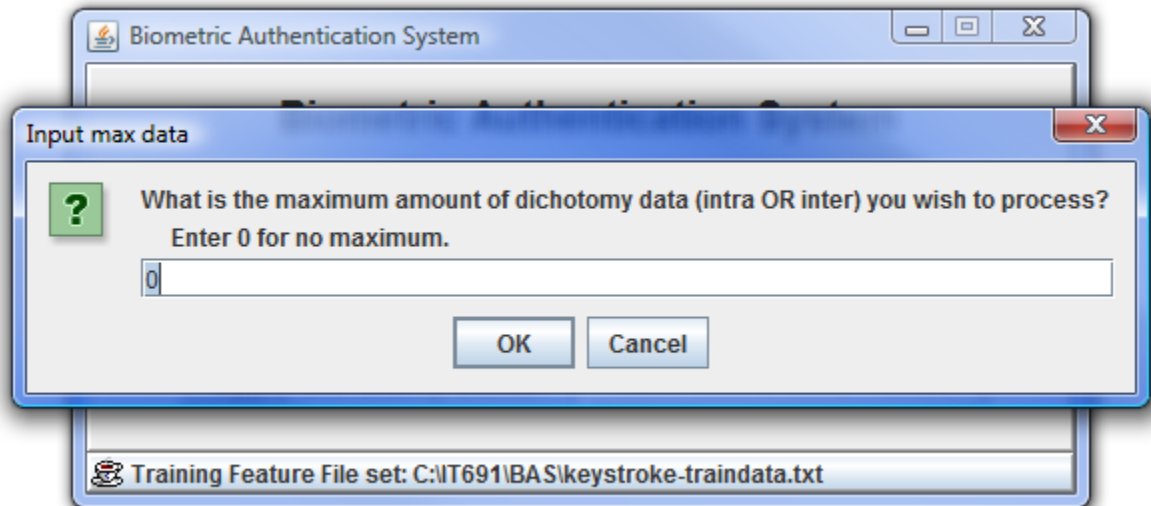
Download the test data file, `keystroke-testdata.txt` and the train data file, `keystroke-traindata.txt` to your `c:\it691\BAS` directory.

- In the Test Feature File field, enter the testing data file name, `keystroke-testdata.txt`.
- In the Train Feature File field, enter the training data file name, `keystroke-traindata.txt`.
- Leave the Lowest N choices at the default of 10.

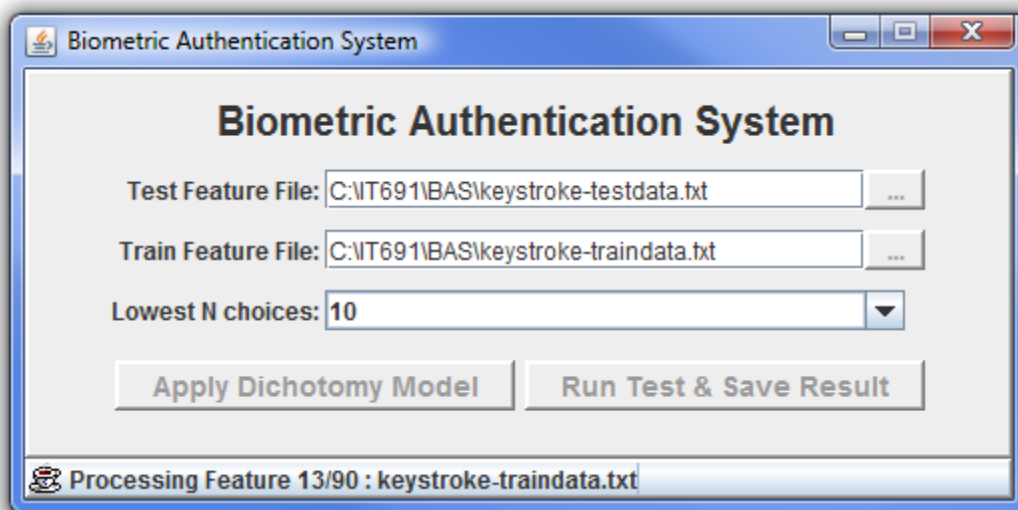


Step 4: Dichotomize Data

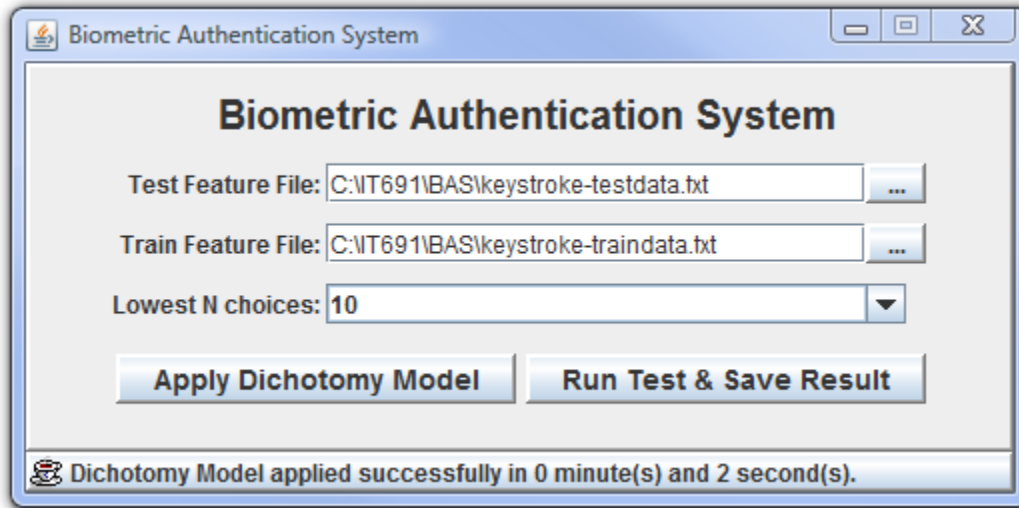
- Select the 'Apply Dichotomy Model' button. A dialogue box "Input max data" will open. Since we will not be restricting the amount of dichotomy data, leave this field at the default of 0 and click "OK". This will use all data.



- After pressing "OK" to the maximum dichotomy data size, the system will begin to process the data. It will process in a few seconds. Notice the "Processing Feature" count in the status bar at the bottom of the dialogue box.

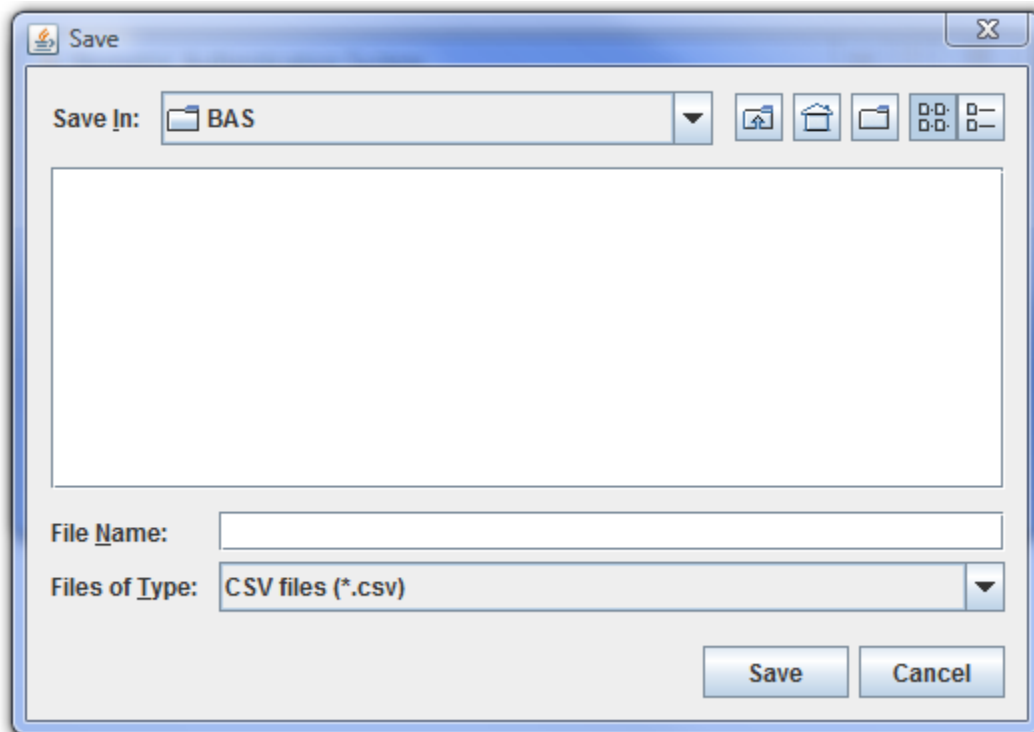


- After processing completes, a dialogue box similar to the following will appear. Observe the "Run Test & Save Result" button is now clickable. Before dichotomizing the data, this button was grayed out.

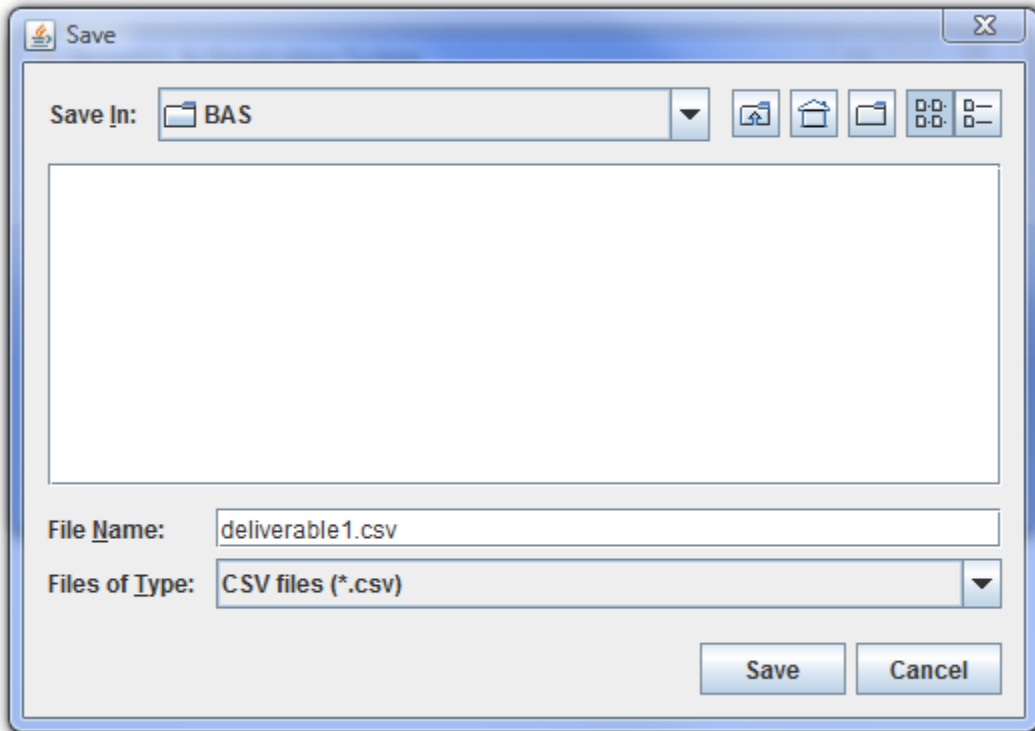


Step 5: Run Experiment

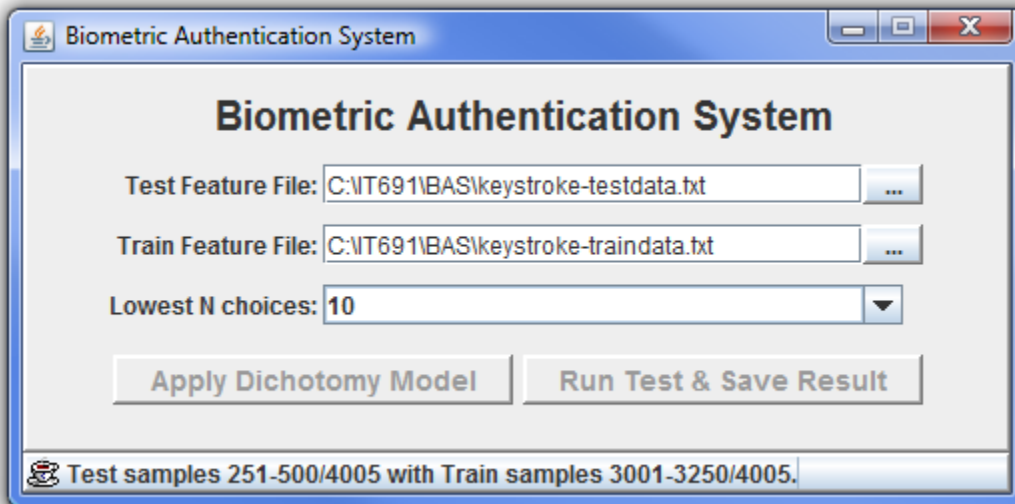
- Click the "Run Test & Save Result" button. A dialogue box will open:



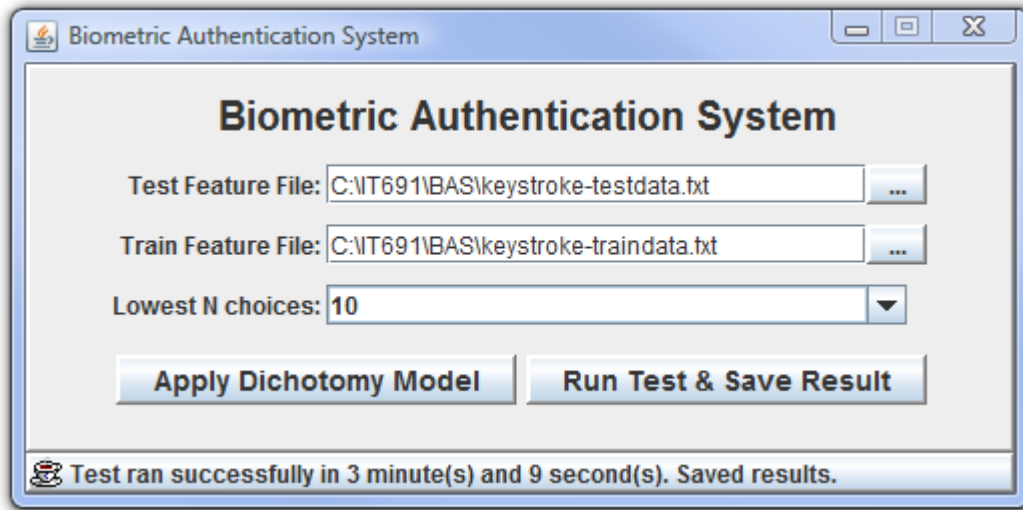
- Enter a name in the File Name field. For this exercise, use "deliverable1.csv".



- After pressing the “Save” button, the experiment will run. Observe the “Test samples” in the status bar at the bottom of the dialogue box. It will continue to increment as the testing and training samples are processed. Depending on your computer, this experiment should take approximately 3-10 minutes to run.



When the processing is complete, the status bar will indicate a successful test run.



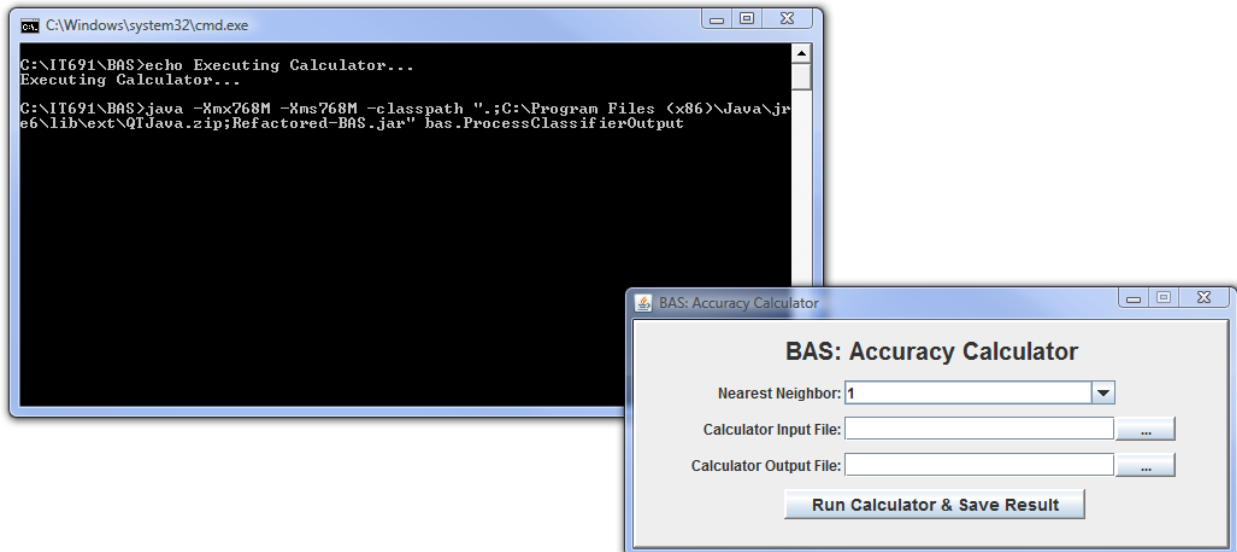
Step 6: Check the output data file

The file “deliverable1.csv” should exist in your C:\it691\BAS directory. Other files containing Meta and dichotomy data are also present in the directory and were created during the previous steps. Using a spreadsheet or text editor, you can view this file. It will be used in the next steps.

- You can now close the BAS application by clicking on the “X” in the top right of the dialogue box.

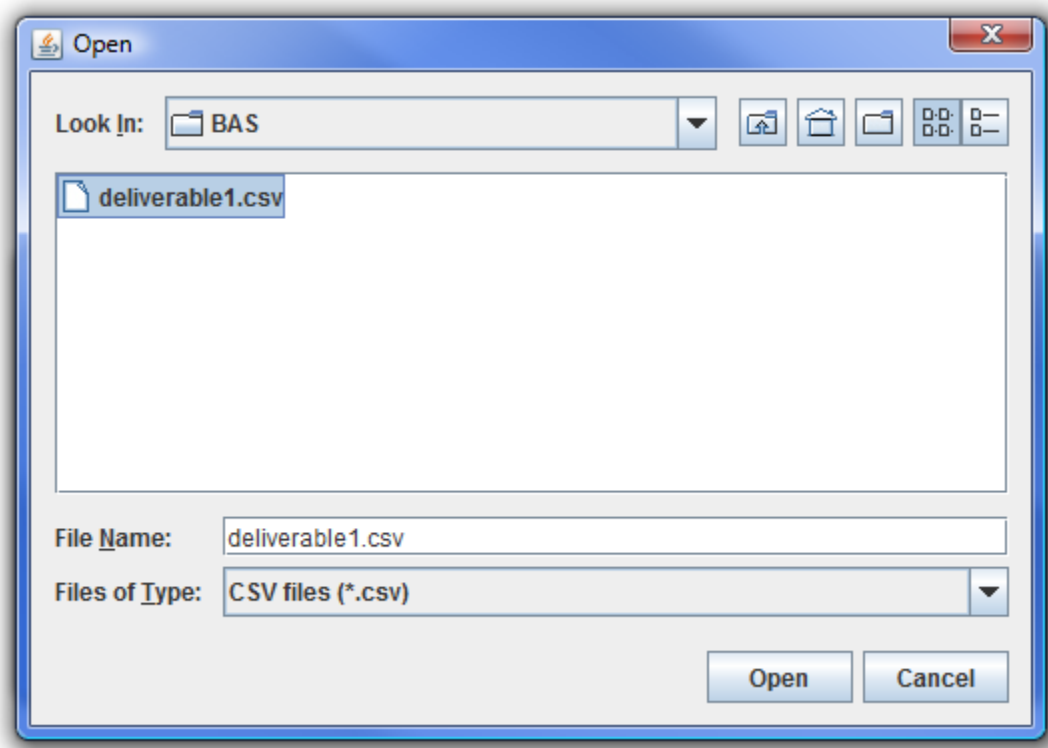
Step 7: Process the output data file and check the results

- Using Windows Explorer or a command prompt, go to the c:\it691\BAS directory and run the Calculator.bat program. The following windows should display:

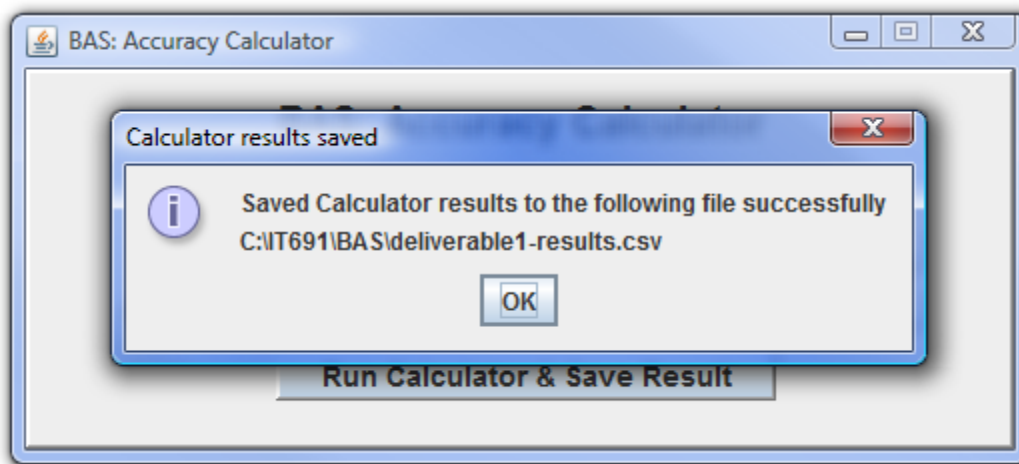


The command window can be minimized if desired, but must not be closed.

- Select the “deliverable1.csv” file you created in the previous step for the File Name and press the “Open” button.



- Enter an Output File Name in the “Calculator Output File” field. For this exercise, enter “c:\it691\deliverable1-results.csv”.
- Press the “Run Calculator & Save Result” button.



- Press “OK” to close the dialogue box.
- A BAS Result Window will appear. Press the “Close & Accumulate” button on the bottom left of the dialogue box.

Result										
Biometric	Test	Test Sizes	Train	Train Sizes	FRR	FAR	Performance	Test Subje...	Train Subj...	kNN
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	10.00% (1...	3.29% (12...	96.40% (3...	18 5.00	18 5.00	1

Close & Accumulate Save Result Close & Clear

BAS: Accuracy Calculator

Nearest Neighbor:

Calculator Input File: ...

Calculator Output File: ...

Run Calculator & Save Result

- The BAS: Accuracy Calculator window will appear again. Change the Nearest Neighbor to 3. The Calculator Input File and Output File should default to their previous settings. These should remain the same.
- Press the Run Calculator & Save Result button. The Calculator results saved dialog box will open. Press “OK” to clear. The accumulated results should appear.

Result										
Biometric	Test	Test Sizes	Train	Train Sizes	FRR	FAR	Performance	Test Subje...	Train Subj...	kNN
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	10.00% (1...	3.29% (12...	96.40% (3...	18 5.00	18 5.00	1
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	13.33% (2...	2.35% (90/...	97.15% (3...	18 5.00	18 5.00	3

- Press Close & Accumulate and repeat for 5, 7, and 9 Nearest Neighbors. After 1, 3, 5, 7, and 9 nearest neighbors are processed, the Result window should look exactly like:

Result										
Biometric	Test	Test Sizes	Train	Train Sizes	FRR	FAR	Performance	Test Subje...	Train Subj...	kNN
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	10.00% (1...	3.29% (12...	96.40% (3...	18 5.00	18 5.00	1
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	13.33% (2...	2.35% (90/...	97.15% (3...	18 5.00	18 5.00	3
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	12.78% (2...	2.41% (92/...	97.13% (3...	18 5.00	18 5.00	5
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	11.67% (2...	2.04% (78/...	97.53% (3...	18 5.00	18 5.00	7
Keystroke	LAPTOP/F...	180-3825	LAPTOP/F...	180-3825	11.11% (2...	1.86% (71/...	97.73% (3...	18 5.00	18 5.00	9

- Press Save Result (middle button on bottom of dialogue box). A dialogue box will open. Enter "deliverable1-processed-results" in the File Name field. The extension will be .html and the file will be stored in your c:\it691\BAS directory. You can open this in many browsers or programs that understand HTML.

The screenshot shows a Mozilla Firefox browser window with the address bar displaying 'file:///C:/IT691/BAS/deliverable1-processed-results.html'. The main content area is titled 'Biometric Authentication System Results' and contains a table with 11 columns: Biometric, Test, Test Sizes, Train, Train Sizes, FRR, FAR, Performance, Test Subject | AVG(Sample), Train Subject | AVG(Sample), and kNN. Below the table is a legend explaining the abbreviations used.

Biometric	Test	Test Sizes	Train	Train Sizes	FRR	FAR	Performance	Test Subject AVG(Sample)	Train Subject AVG(Sample)	kNN
Keystroke	LAPTOP/FREETEXT7 1	180-3825	LAPTOP/FREETEXT7 1	180-3825	10.00% (18/180)	3.29% (126/3825)	96.40% (3861/4005)	18 5.00	18 5.00	1
Keystroke	LAPTOP/FREETEXT7 1	180-3825	LAPTOP/FREETEXT7 1	180-3825	13.33% (24/180)	2.35% (90/3825)	97.15% (3891/4005)	18 5.00	18 5.00	3
Keystroke	LAPTOP/FREETEXT7 1	180-3825	LAPTOP/FREETEXT7 1	180-3825	12.78% (23/180)	2.41% (92/3825)	97.13% (3890/4005)	18 5.00	18 5.00	5
Keystroke	LAPTOP/FREETEXT7 1	180-3825	LAPTOP/FREETEXT7 1	180-3825	11.67% (21/180)	2.04% (78/3825)	97.53% (3906/4005)	18 5.00	18 5.00	7
Keystroke	LAPTOP/FREETEXT7 1	180-3825	LAPTOP/FREETEXT7 1	180-3825	11.11% (20/180)	1.86% (71/3825)	97.73% (3914/4005)	18 5.00	18 5.00	9

Legend
 Biometric: Type of Biometric
 Test: The Biometric test that was ran
 Test Sizes: The sample size of Intra-class and Inter-class of testing set
 Train: The Biometric train that was ran
 Train Sizes: The sample size of Intra-class and Inter-class of training set
 FRR: False Rejection Rate
 FAR: False Acceptance Rate
 Performance: Overall Performance of the test
 Test Subject | AVG(Sample): Testing Feature File # of Subject | Average # of Sample per Subject
 Train Subject | AVG(Sample): Training Feature File # of Subject | Average # of Sample per Subject
 kNN: k Nearest Neighbor

Step 7: Verify your results

Compare your results to the published “Improved Biometric Authentication” results for the LapFree condition using 1 nearest neighbor (<http://support.csis.pace.edu/CSISWeb/docs/techReports/techReport268.pdf>, page 6).

Your results should be identical.

LapFree	180-3825	180-3825	10.0%	3.3%	96.4%
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