NIST Special Database 4
NIST 8-Bit Gray Scale Images of Fingerprint Image Groups(FIGS)

Craig Watson
Patricia Flanagan

National Institute of Standards and Technology
U.S. Department of Commerce

NIST Special Database 4
NIST 8-Bit Gray Scale Images of Fingerprint Image Groups(FIGS)

Craig Watson
Information Technology Laboratory
Information Access Division

Patricia Flanagan
Information Technology Laboratory
Information Access Division

April 2016

U.S. Department of Commerce
Penny Pritzker, Secretary

National Institute of Standards and Technology
Willie May, Under Secretary of Commerce for Standards and Technology and Director

Table of Contents

1.0 Introduction 2

1.1 Image File Conversion 2

1.2 Text file creation 3

2.0 Cross-Referenced Fingerprints 3

2.1 Database Reflectance Calibration 4

3.0 References 5

4.0 Appendixes 5

Appendix A: Database Fingerprint Image Samples 6

Appendix B: Database Reflectance and Resolution Calibration 8

Appendix C: Chart of Referenced Fingerprints 10

NIST Special Database 4

Fingerprint Database

1.0 Introduction

This document describes the updated web release of the NIST Special Database 4, which contains 4000 fingerprint images in PNG format. The previously released CD-ROM NIST *Special Database 4* consists of NIST IHEAD formatted images using a modified JPEG lossless [1] compression algorithm. The updated Special Database 4 (SD4) was taken from ANSI/NIST (AN2) [2] formatted files which consisted of 8-bit gray scale rolled fingerprint images for the 10 fingers on the left and right hands.

The updated web released Special Database 4 consist of a zip file with 4000 Portable Network Graphics (PNG) [3] fingerprint images and corresponding "TXT" (metadata)files. The database is being distributed for use in the development and testing of automated fingerprint classification systems on a common set of images. Each print is 512 X 512 pixels with 32 rows of white space at the bottom of the print (see Figure A.1 in Appendix A). The naming of the AN2 files is set up as f0001_04.an2.

The "f" in the start of the file is for the first instance and the "s" is for the second instance. The file numbering to identify the subjects starts with 0001 and ends with 0500 for each of the f and the s "AN2" files. The two numbers after the underscore in the file is for the finger in the file, representing the finger number in the same order as on a fingerprint card (see Figure 2). This SD4 data directory contains PNG (image) files and "TXT" (metadata) files with information extracted from the AN2 file using NIST Biometric Image Software (NBIS) [4] an2ktool and Netpbm vi and grep commands. Below are the steps taken to convert the original database images to the updated web version.

1.1 Image File Conversion

a. The NBIS *An2ktool* was used to extract Type-1, Type-2, and Type-14 record information and images from an ANSI/NIST file. Each image file was renamed to reflect the name of the original ANSI/NIST file and the finger position of the image (e.g., a001_01.xxx).

b. The NBIS *Djpegl* program was used to convert the JPEGL file into a) a raw image and b) a NISTCOM (NCM) [1] text file which contains the image height and width information.

c. The Netpbm *Rawtopgm* program, along with the height and the width of the image was used to convert the raw image into a PGM (Netpgm grayscale image) file.

d. The Netpbm *Pnmtopng* program was used to convert the PGM to a PNG (e.g., crd_0001f_01.png) file.

1.2 Text file creation

1. There is no information from the Type-1 record that was extracted for the TXT file.

2. The Type-2 record contains the field (2.024) that has the gender of the subject in the AN2 file. The Gender information was extracted and put into a metadata file with the same naming as the PNG file but with the TXT extension.

3. The Type-14 record holds the image for the subject and some information pertaining to the image. The field (14.013) has the finger position of the image which is extracted and put in the txt file. The field (14.020) has the Class, History and Scan type values (e.g., "Class: W, History: f0001_01.pct W a0591.pct Scan Type: i") is extracted and put into the existing metadata file that corresponds to the image file.

4. Each metadata file contains the Gender, the finger position of the image and the Class, History and Scan type of the image.

5. In each directory there are ten PNG files and ten corresponding metadata files. See structure of database in Figure 1.

2.0 Cross-Referenced Fingerprints

The fingerprints are classified into one of five categories (L = left loop, W = whirl, R = right loop, T = tented arch, and A = arch) with an equal number of prints (400) from each class. Each filename contains a reference to the hand and digit number so the classes can be converted to other classification techniques (i.e. radial and ulnar).

The cross-referencing of a fingerprint is caused by a variety of ambiguities such as a scar occurring in the fingerprint, the quality of the print rolling, or the print having ridge structures characteristic of two different classes. The cross-referenced prints could easily cause a wrong classification when used in testing an automatic classification system, but could provide a challenge in the later stages of development. NIST Special Database 4 contains 350 fingerprint pairs (17.5%) whose classifications are cross-referenced to a second classification (see Appendix C for a listing of files with cross references).

The metadata files of these prints contain the fingerprint classifications immediately followed by the cross-referenced class. A good example is the first file listed in Appendix C (f0008_10.pct, shown in Figure A.2 of Appendix A). The fingerprint is classified as a tented arch; however, the ridge structure is also similar to that of a left loop so a cross-reference of left loop is given in this file’s metadata history field.

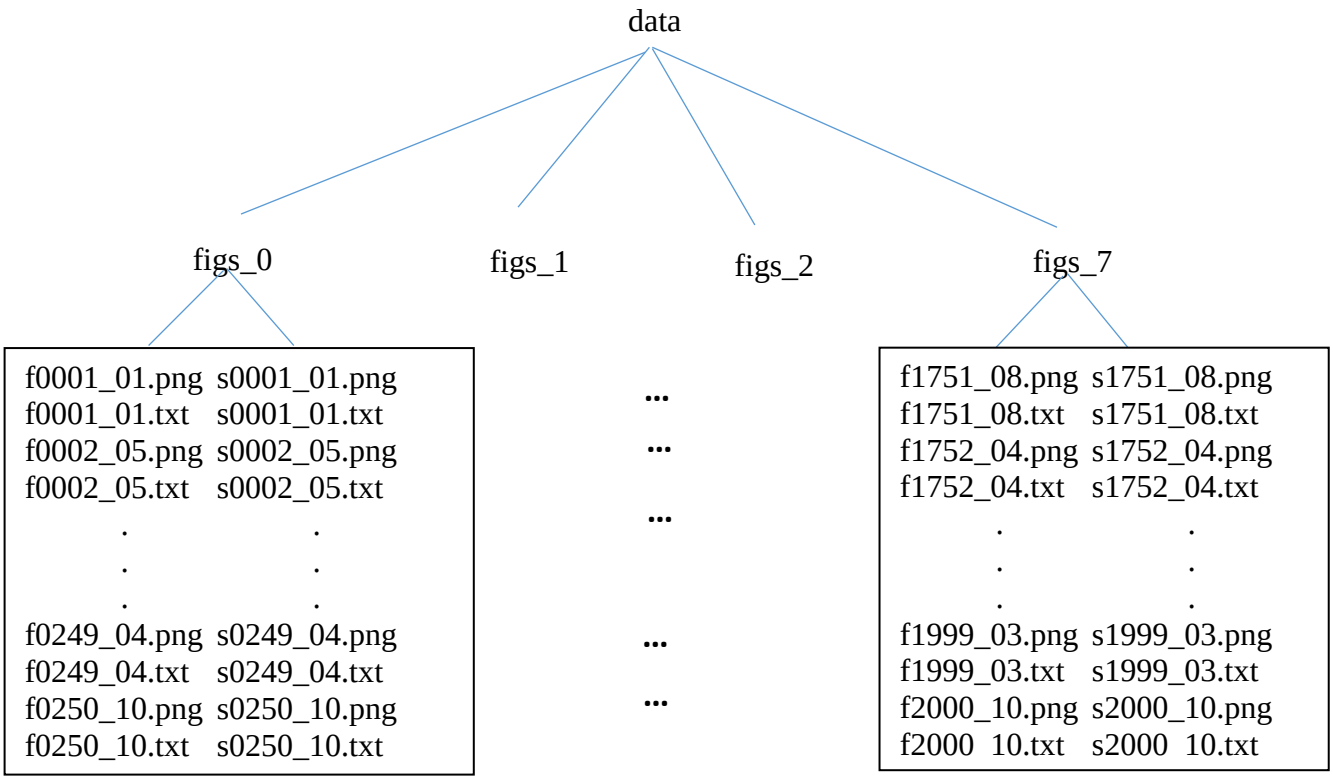

Figure 1: Arrangement of fingerprint files for *NIST Special Database 4*

1. R. Thumb	2. R. Index	3. R. Middle	4. R. Ring	5. R. Little
6. L. Thumb	7. L. Index	8. L. Middle	9. L. Ring	10. L. Little

Figure 2: Layout of Fingerprint Card Numbers

2.1 Database Reflectance Calibration

The reflectance values for the fingerprint database, NIST Special Database 9, were calibrated using a reflection step table [5]. A plot of the reflectance values obtained using this step table is shown in Appendix B. Also shown on the plot and below is an equation used to predict the reflectance of a give datapoint. The plot in Appendix B shows that this predicted reflectance closely follows the actual reflectance obtained using the reflection step table.

$$\text{predicted \% reflectance} = -5.1 + (.36 * \text{grayscale pixel value})$$

3.0 References

[1]"Information technology -- Lossless and near-lossless compression of continuous tone still images: Baseline," International Organization of Standardization/International Electrotechnical Commission, ISO/IEC 14495-1:1999.

[2] K. Mangold Ed., "Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information," American National Standard, ANSI/NIST-ITL 1-2011:2015.

[3] "Information technology -- Computer graphics and image processing -- Portable Network Graphics (PNG): Functional specification," International Organization of Standardization/International Electrotechnical Commission, ISO/IEC 15948:2004

[4] C. Watson et al., "User's Guide to NIST Biometric Image Software," National Institute of Standards and Technology ITL/IAD/Image Group, October 2004.

[5] National Bureau of Standards, “Standard Reference Materials,” Reflection Step Table 2601.

4.0 Appendixes

The Appendixes are from the original CD-ROM *NIST Special Database 4* documentation. The original database was distributed in 1992. The CD-ROM contained 4000 (2000 pairs) fingerprints. The information in the Appendixes reflect the original data.

Appendix A – Database Fingerprint Image Samples
Appendix B – Database Reflectance and Resolution Calibration
Appendix C – Chart of Referenced Fingerprints

Appendix A: Database Fingerprint Image Samples

Figure A.1: Fingerprint file **f0001_01.pct** from *NIST Special Database 4.*

Figure A.2: Fingerprint file **f0008_10.pct** from *NIST Special Database 4*

Appendix B: Database Reflectance and Resolution Calibration

Contact Craig Watson for Reflectance Plot

Email => **craig.watson@nist.gov**

Phone => (301) 975-4402

Database Resolution Calibration

The resolution of the scanner used to create the database was calibrated using a NBS 1010A resolution chart[1]. A portion of this image is shown below (Figure B.1) after being magnified for viewing (Note: Printing has reduced the overall quality of this image.). The scan of the table showed that the vertical resolution was approximately 8.1 line pairs/millimeter and the horizontal resolution was approximately 6.3 line pairs/millimeter.

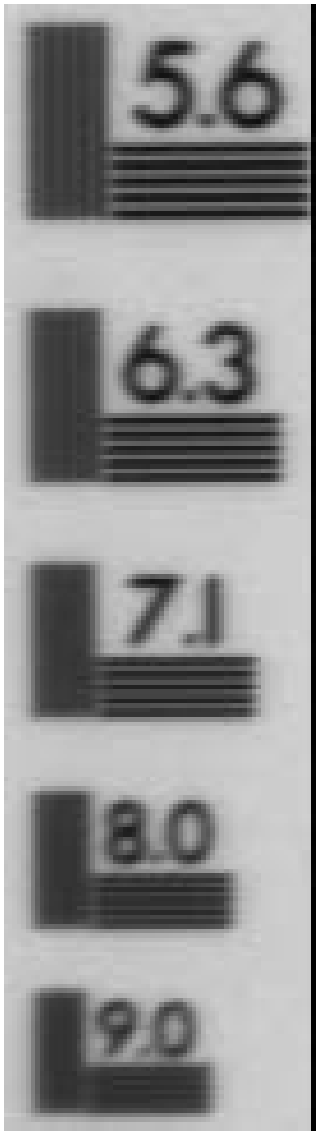

Figure B.1: Scan of Resolution Calibration Table.

1. National Bureau of Standards, Microcopy Resolution Test Chart, Standard Reference Material 1010a, ANSI and ISO test chart No. 2.

Appendix C: Chart of Referenced Fingerprints

f0008_10.pct (crid) = L :: s0008_10.pct (crid) = L
f0026_03.pct (crid) = R :: s0026_03.pct (crid) = R
f0028_08.pct (crid) = L :: s0028_08.pct (crid) = L
f0036_04.pct (crid) = R :: s0036_04.pct (crid) = R
f0038_02.pct (crid) = L :: s0038_02.pct (crid) = L
f0039_03.pct (crid) = R :: s0039_03.pct (crid) = R
f0047_01.pct (crid) = A :: s0047_01.pct (crid) = A
f0049_03.pct (crid) = R :: s0049_03.pct (crid) = R
f0050_01.pct (crid) = A :: s0050_01.pct (crid) = A
f0053_04.pct (crid) = R :: s0053_04.pct (crid) = R
f0054_03.pct (crid) = R :: s0054_03.pct (crid) = R
f0070_10.pct (crid) = T :: s0070_10.pct (crid) = T
f0073_07.pct (crid) = L :: s0073_07.pct (crid) = L
f0076_07.pct (crid) = R :: s0076_07.pct (crid) = R
f0087_03.pct (crid) = A :: s0087_03.pct (crid) = A
f0091_10.pct (crid) = T :: s0091_10.pct (crid) = T
f0103_10.pct (crid) = T :: s0103_10.pct (crid) = T
f0105_03.pct (crid) = R :: s0105_03.pct (crid) = R
f0108_03.pct (crid) = R :: s0108_03.pct (crid) = R
f0110_08.pct (crid) = T :: s0110_08.pct (crid) = T
f0112_02.pct (crid) = R :: s0112_02.pct (crid) = R
f0123_06.pct (crid) = T :: s0123_06.pct (crid) = T
f0126_10.pct (crid) = A :: s0126_10.pct (crid) = A
f0127_04.pct (crid) = R :: s0127_04.pct (crid) = R
f0132_07.pct (crid) = L :: s0132_07.pct (crid) = L
f0134_03.pct (crid) = R :: s0134_03.pct (crid) = R
f0140_08.pct (crid) = A :: s0140_08.pct (crid) = A
f0146_08.pct (crid) = L :: s0146_08.pct (crid) = L
f0154_08.pct (crid) = T :: s0154_08.pct (crid) = T
f0160_08.pct (crid) = A :: s0160_08.pct (crid) = A
f0163_03.pct (crid) = R :: s0163_03.pct (crid) = R
f0171_08.pct (crid) = T :: s0171_08.pct (crid) = T
f0172_08.pct (crid) = R :: s0172_08.pct (crid) = R
f0177_02.pct (crid) = R :: s0177_02.pct (crid) = R
f0178_02.pct (crid) = A :: s0178_02.pct (crid) = A
f0186_04.pct (crid) = A :: s0186_04.pct (crid) = A
f0187_08.pct (crid) = L :: s0187_08.pct (crid) = L
f0195_07.pct (crid) = L :: s0195_07.pct (crid) = L
f0207_05.pct (crid) = T :: s0207_05.pct (crid) = T
f0208_03.pct (crid) = A :: s0208_03.pct (crid) = A
f0210_09.pct (crid) = T :: s0210_09.pct (crid) = T
f0212_04.pct (crid) = T :: s0212_04.pct (crid) = T

f0217_02.pct (crid) = R :: s0217_02.pct (crid) = R
f0225_10.pct (crid) = L :: s0225_10.pct (crid) = L
f0229_08.pct (crid) = A :: s0229_08.pct (crid) = A
f0241_04.pct (crid) = T :: s0241_04.pct (crid) = T
f0243_08.pct (crid) = A :: s0243_08.pct (crid) = A
f0246_02.pct (crid) = R :: s0246_02.pct (crid) = R
f0259_10.pct (crid) = T :: s0259_10.pct (crid) = T
f0260_02.pct (crid) = L :: s0260_02.pct (crid) = L
f0267_07.pct (crid) = T :: s0267_07.pct (crid) = T
f0268_09.pct (crid) = T :: s0268_09.pct (crid) = T
f0280_02.pct (crid) = R :: s0280_02.pct (crid) = R
f0282_03.pct (crid) = A :: s0282_03.pct (crid) = A
f0283_02.pct (crid) = A :: s0283_02.pct (crid) = A
f0295_07.pct (crid) = L :: s0295_07.pct (crid) = L
f0300_08.pct (crid) = A :: s0300_08.pct (crid) = A
f0233_08.pct (crid) = L :: s0233_08.pct (crid) = L
f0303_03.pct (crid) = R :: s0303_03.pct (crid) = R
f0304_08.pct (crid) = A :: s0304_08.pct (crid) = A
f0314_04.pct (crid) = T :: s0314_04.pct (crid) = T
f0316_03.pct (crid) = R :: s0316_03.pct (crid) = R
f0317_05.pct (crid) = T :: s0317_05.pct (crid) = T
f0321_05.pct (crid) = A :: s0321_05.pct (crid) = A
f0344_06.pct (crid) = A :: s0344_06.pct (crid) = A
f0347_02.pct (crid) = L :: s0347_02.pct (crid) = L
f0348_08.pct (crid) = T :: s0348_08.pct (crid) = T
f0349_09.pct (crid) = T :: s0349_09.pct (crid) = T
f0351_08.pct (crid) = L :: s0351_08.pct (crid) = L
f0353_03.pct (crid) = R :: s0353_03.pct (crid) = R
f0355_08.pct (crid) = A :: s0355_08.pct (crid) = A
f0371_05.pct (crid) = R :: s0371_05.pct (crid) = R
f0386_02.pct (crid) = R :: s0386_02.pct (crid) = R
f0394_07.pct (crid) = A :: s0394_07.pct (crid) = A
f0400_02.pct (crid) = R :: s0400_02.pct (crid) = R
f0403_07.pct (crid) = A :: s0403_07.pct (crid) = A
f0406_04.pct (crid) = A :: s0406_04.pct (crid) = A
f0419_08.pct (crid) = L :: s0419_08.pct (crid) = L
f0423_02.pct (crid) = R :: s0423_02.pct (crid) = R
f0424_03.pct (crid) = R :: s0424_03.pct (crid) = R
f0429_04.pct (crid) = T :: s0429_04.pct (crid) = T
f0435_10.pct (crid) = A :: s0435_10.pct (crid) = A
f0456_06.pct (crid) = L :: s0456_06.pct (crid) = L
f0461_03.pct (crid) = R :: s0461_03.pct (crid) = R
f0466_10.pct (crid) = L :: s0466_10.pct (crid) = L
f0469_07.pct (crid) = A :: s0469_07.pct (crid) = A
f0486_10.pct (crid) = L :: s0486_10.pct (crid) = L
f0500_02.pct (crid) = T :: s0500_02.pct (crid) = T

f0509_07.pct (crid) = T :: s0509_07.pct (crid) = T
f0510_07.pct (crid) = L :: s0510_07.pct (crid) = L
f0513_07.pct (crid) = L :: s0513_07.pct (crid) = L
f0516_02.pct (crid) = R :: s0516_02.pct (crid) = R
f0537_09.pct (crid) = L :: s0537_09.pct (crid) = L
f0539_02.pct (crid) = R :: s0539_02.pct (crid) = R
f0540_08.pct (crid) = T :: s0540_08.pct (crid) = T
f0550_02.pct (crid) = R :: s0550_02.pct (crid) = R
f0551_08.pct (crid) = R :: s0551_08.pct (crid) = R
f0559_09.pct (crid) = T :: s0559_09.pct (crid) = T
f0560_08.pct (crid) = A :: s0560_08.pct (crid) = A
f0561_08.pct (crid) = A :: s0561_08.pct (crid) = A
f0568_07.pct (crid) = A :: s0568_07.pct (crid) = A
f0571_02.pct (crid) = A :: s0571_02.pct (crid) = A
f0574_09.pct (crid) = R :: s0574_09.pct (crid) = R
f0581_04.pct (crid) = R :: s0581_04.pct (crid) = R
f0586_02.pct (crid) = T :: s0586_02.pct (crid) = T
f0595_08.pct (crid) = A :: s0595_08.pct (crid) = A
f0598_08.pct (crid) = A :: s0598_08.pct (crid) = A
f0610_04.pct (crid) = R :: s0610_04.pct (crid) = R
f0616_08.pct (crid) = L :: s0616_08.pct (crid) = L
f0617_01.pct (crid) = A :: s0617_01.pct (crid) = A
f0624_03.pct (crid) = A :: s0624_03.pct (crid) = A
f0646_09.pct (crid) = T :: s0646_09.pct (crid) = T
f0659_10.pct (crid) = L :: s0659_10.pct (crid) = L
f0660_02.pct (crid) = R :: s0660_02.pct (crid) = R
f0664_03.pct (crid) = T :: s0664_03.pct (crid) = T
f0668_02.pct (crid) = R :: s0668_02.pct (crid) = R
f0674_04.pct (crid) = R :: s0674_04.pct (crid) = R
f0676_02.pct (crid) = R :: s0676_02.pct (crid) = R
f0684_02.pct (crid) = R :: s0684_02.pct (crid) = R
f0692_02.pct (crid) = L :: s0692_02.pct (crid) = L
f0693_03.pct (crid) = A :: s0693_03.pct (crid) = A
f0697_07.pct (crid) = L :: s0697_07.pct (crid) = L
f0698_08.pct (crid) = R :: s0698_08.pct (crid) = R
f0702_08.pct (crid) = L :: s0702_08.pct (crid) = L
f0703_02.pct (crid) = A :: s0703_02.pct (crid) = A
f0708_03.pct (crid) = R :: s0708_03.pct (crid) = R
f0713_03.pct (crid) = T :: s0713_03.pct (crid) = T
f0721_03.pct (crid) = R :: s0721_03.pct (crid) = R
f0727_07.pct (crid) = L :: s0727_07.pct (crid) = L
f0728_09.pct (crid) = A :: s0728_09.pct (crid) = A
f0731_02.pct (crid) = R :: s0731_02.pct (crid) = R
f0733_08.pct (crid) = L :: s0733_08.pct (crid) = L
f0741_03.pct (crid) = A :: s0741_03.pct (crid) = A
f0742_07.pct (crid) = L :: s0742_07.pct (crid) = L

f0743_07.pct (crid) = R :: s0743_07.pct (crid) = R
f0744_08.pct (crid) = R :: s0744_08.pct (crid) = R
f0746_10.pct (crid) = L :: s0746_10.pct (crid) = L
f0757_10.pct (crid) = T :: s0757_10.pct (crid) = T
f0758_07.pct (crid) = A :: s0758_07.pct (crid) = A
f0760_06.pct (crid) = L :: s0760_06.pct (crid) = L
f0765_07.pct (crid) = R :: s0765_07.pct (crid) = R
f0769_04.pct (crid) = T :: s0769_04.pct (crid) = T
f0771_03.pct (crid) = R :: s0771_03.pct (crid) = R
f0780_05.pct (crid) = R :: s0780_05.pct (crid) = R
f0781_02.pct (crid) = T :: s0781_02.pct (crid) = T
f0796_08.pct (crid) = A :: s0796_08.pct (crid) = A
f0804_03.pct (crid) = A :: s0804_03.pct (crid) = A
f0806_04.pct (crid) = T :: s0806_04.pct (crid) = T
f0844_03.pct (crid) = R :: s0844_03.pct (crid) = R
f0850_07.pct (crid) = A :: s0850_07.pct (crid) = A
f0856_02.pct (crid) = R :: s0856_02.pct (crid) = R
f0862_08.pct (crid) = L :: s0862_08.pct (crid) = L
f0864_05.pct (crid) = R :: s0864_05.pct (crid) = R
f0868_07.pct (crid) = R :: s0868_07.pct (crid) = R
f0877_02.pct (crid) = T :: s0877_02.pct (crid) = T
f0884_03.pct (crid) = R :: s0884_03.pct (crid) = R
f0891_07.pct (crid) = L :: s0891_07.pct (crid) = L
f0894_06.pct (crid) = A :: s0894_06.pct (crid) = A
f0897_08.pct (crid) = R :: s0897_08.pct (crid) = R
f0905_03.pct (crid) = R :: s0905_03.pct (crid) = R
f0909_07.pct (crid) = L :: s0909_07.pct (crid) = L
f0910_07.pct (crid) = R :: s0910_07.pct (crid) = R
f0916_09.pct (crid) = T :: s0916_09.pct (crid) = T
f0922_07.pct (crid) = L :: s0922_07.pct (crid) = L
f0934_10.pct (crid) = W :: s0934_10.pct (crid) = W
f0938_06.pct (crid) = T :: s0938_06.pct (crid) = T
f0941_02.pct (crid) = R :: s0941_02.pct (crid) = R
f0948_02.pct (crid) = T :: s0948_02.pct (crid) = T
f0950_02.pct (crid) = R :: s0950_02.pct (crid) = R
f0958_09.pct (crid) = L :: s0958_09.pct (crid) = L
f0959_07.pct (crid) = R :: s0959_07.pct (crid) = R
f0964_03.pct (crid) = R :: s0964_03.pct (crid) = R
f0983_03.pct (crid) = T :: s0983_03.pct (crid) = T
f0993_08.pct (crid) = A :: s0993_08.pct (crid) = A
f0994_04.pct (crid) = A :: s0994_04.pct (crid) = A
f0998_06.pct (crid) = T :: s0998_06.pct (crid) = T
f1000_07.pct (crid) = A :: s1000_07.pct (crid) = A
f1001_05.pct (crid) = R :: s1001_05.pct (crid) = R
f1003_04.pct (crid) = R :: s1003_04.pct (crid) = R
f1008_08.pct (crid) = A :: s1008_08.pct (crid) = A

f1010_02.pct (crid) = R :: s1010_02.pct (crid) = R
f1042_03.pct (crid) = R :: s1042_03.pct (crid) = R
f1045_04.pct (crid) = R :: s1045_04.pct (crid) = R
f0964_03.pct (crid) = R :: s0964_03.pct (crid) = R
f0983_03.pct (crid) = T :: s0983_03.pct (crid) = T
f0993_08.pct (crid) = A :: s0993_08.pct (crid) = A
f0994_04.pct (crid) = A :: s0994_04.pct (crid) = A
f0998_06.pct (crid) = T :: s0998_06.pct (crid) = T
f0964_03.pct (crid) = R :: s0964_03.pct (crid) = R
f0983_03.pct (crid) = T :: s0983_03.pct (crid) = T
f0993_08.pct (crid) = A :: s0993_08.pct (crid) = A
f0994_04.pct (crid) = A :: s0994_04.pct (crid) = A
f0998_06.pct (crid) = T :: s0998_06.pct (crid) = T
f1082_08.pct (crid) = L :: s1082_08.pct (crid) = L
f1083_02.pct (crid) = A :: s1083_02.pct (crid) = A
f1087_02.pct (crid) = R :: s1087_02.pct (crid) = R
f1088_03.pct (crid) = R :: s1088_03.pct (crid) = R
f1095_09.pct (crid) = T :: s1095_09.pct (crid) = T
f1098_02.pct (crid) = R :: s1098_02.pct (crid) = R
f1099_05.pct (crid) = T :: s1099_05.pct (crid) = T
f1106_07.pct (crid) = A :: s1106_07.pct (crid) = A
f1115_03.pct (crid) = R :: s1115_03.pct (crid) = R
f1119_02.pct (crid) = R :: s1119_02.pct (crid) = R
f1123_08.pct (crid) = L :: s1123_08.pct (crid) = L
f1138_10.pct (crid) = T :: s1138_10.pct (crid) = T
f1143_03.pct (crid) = R :: s1143_03.pct (crid) = R
f1146_03.pct (crid) = R :: s1146_03.pct (crid) = R
f1149_09.pct (crid) = R :: s1149_09.pct (crid) = R
f1163_03.pct (crid) = L :: s1163_03.pct (crid) = L
f1174_07.pct (crid) = R :: s1174_07.pct (crid) = R
f1179_10.pct (crid) = L :: s1179_10.pct (crid) = L
f1181_10.pct (crid) = A :: s1181_10.pct (crid) = A
f1182_02.pct (crid) = A :: s1182_02.pct (crid) = A
f1185_03.pct (crid) = R :: s1185_03.pct (crid) = R
f1186_07.pct (crid) = L :: s1186_07.pct (crid) = L
f1190_04.pct (crid) = T :: s1190_04.pct (crid) = T
f1203_04.pct (crid) = R :: s1203_04.pct (crid) = R
f1206_02.pct (crid) = R :: s1206_02.pct (crid) = R
f1207_02.pct (crid) = R :: s1207_02.pct (crid) = R
f1214_02.pct (crid) = L :: s1214_02.pct (crid) = L
f1220_02.pct (crid) = R :: s1220_02.pct (crid) = R
f1228_02.pct (crid) = A :: s1228_02.pct (crid) = A
f1230_04.pct (crid) = T :: s1230_04.pct (crid) = T
f1232_09.pct (crid) = T :: s1232_09.pct (crid) = T
f1233_04.pct (crid) = W :: s1233_04.pct (crid) = W
f1234_08.pct (crid) = L :: s1234_08.pct (crid) = L

f1238_09.pct (crid) = T :: s1238_09.pct (crid) = T
f1240_03.pct (crid) = R :: s1240_03.pct (crid) = R
f1249_08.pct (crid) = L :: s1249_08.pct (crid) = L
f1255_07.pct (crid) = R :: s1255_07.pct (crid) = R
f1261_07.pct (crid) = A :: s1261_07.pct (crid) = A
f1268_02.pct (crid) = R :: s1268_02.pct (crid) = R
f1277_08.pct (crid) = T :: s1277_08.pct (crid) = T
f1292_07.pct (crid) = T :: s1292_07.pct (crid) = T
f1294_07.pct (crid) = L :: s1294_07.pct (crid) = L
f1300_08.pct (crid) = L :: s1300_08.pct (crid) = L
f1306_08.pct (crid) = L :: s1306_08.pct (crid) = L
f1316_09.pct (crid) = T :: s1316_09.pct (crid) = T
f1317_07.pct (crid) = L :: s1317_07.pct (crid) = L
f1323_03.pct (crid) = A :: s1323_03.pct (crid) = A
f1326_07.pct (crid) = A :: s1326_07.pct (crid) = A
f1330_03.pct (crid) = T :: s1330_03.pct (crid) = T
f1333_08.pct (crid) = L :: s1333_08.pct (crid) = L
f1335_08.pct (crid) = L :: s1335_08.pct (crid) = L
f1341_03.pct (crid) = R :: s1341_03.pct (crid) = R
f1360_02.pct (crid) = R :: s1360_02.pct (crid) = R
f1363_08.pct (crid) = R :: s1363_08.pct (crid) = R
f1366_06.pct (crid) = L :: s1366_06.pct (crid) = L
f1367_02.pct (crid) = R :: s1367_02.pct (crid) = R
f1371_08.pct (crid) = R :: s1371_08.pct (crid) = R
f1384_07.pct (crid) = R :: s1384_07.pct (crid) = R
f1395_02.pct (crid) = T :: s1395_02.pct (crid) = T
f1396_07.pct (crid) = L :: s1396_07.pct (crid) = L
f1399_06.pct (crid) = A :: s1399_06.pct (crid) = A
f1413_07.pct (crid) = R :: s1413_07.pct (crid) = R
f1433_07.pct (crid) = R :: s1433_07.pct (crid) = R
f1437_07.pct (crid) = L :: s1437_07.pct (crid) = L
f1442_07.pct (crid) = R :: s1442_07.pct (crid) = R
f1448_10.pct (crid) = T :: s1448_10.pct (crid) = T
f1449_07.pct (crid) = A :: s1449_07.pct (crid) = A
f1455_03.pct (crid) = R :: s1455_03.pct (crid) = R
f1472_08.pct (crid) = L :: s1472_08.pct (crid) = L
f1479_10.pct (crid) = A :: s1479_10.pct (crid) = A
f1484_02.pct (crid) = A :: s1484_02.pct (crid) = A
f1486_03.pct (crid) = R :: s1486_03.pct (crid) = R
f1498_03.pct (crid) = L :: s1498_03.pct (crid) = L
f1502_04.pct (crid) = R :: s1502_04.pct (crid) = R
f1508_10.pct (crid) = L :: s1508_10.pct (crid) = L
f1513_06.pct (crid) = L :: s1513_06.pct (crid) = L
f1514_01.pct (crid) = A :: s1514_01.pct (crid) = A
f1515_02.pct (crid) = A :: s1515_02.pct (crid) = A
f1518_02.pct (crid) = L :: s1518_02.pct (crid) = L

f1523_05.pct (crid) = W :: s1523_05.pct (crid) = W
f1524_08.pct (crid) = R :: s1524_08.pct (crid) = R
f1536_02.pct (crid) = L :: s1536_02.pct (crid) = L
f1543_03.pct (crid) = R :: s1543_03.pct (crid) = R
f1544_05.pct (crid) = R :: s1544_05.pct (crid) = R
f1553_08.pct (crid) = L :: s1553_08.pct (crid) = L
f1558_07.pct (crid) = R :: s1558_07.pct (crid) = R
f1560_02.pct (crid) = L :: s1560_02.pct (crid) = L
f1570_09.pct (crid) = T :: s1570_09.pct (crid) = T
f1575_08.pct (crid) = L :: s1575_08.pct (crid) = L
f1576_06.pct (crid) = L :: s1576_06.pct (crid) = L
f1584_03.pct (crid) = R :: s1584_03.pct (crid) = R
f1588_07.pct (crid) = R :: s1588_07.pct (crid) = R
f1592_02.pct (crid) = R :: s1592_02.pct (crid) = R
f1593_04.pct (crid) = T :: s1593_04.pct (crid) = T
f1599_04.pct (crid) = T :: s1599_04.pct (crid) = T
f1603_08.pct (crid) = A :: s1603_08.pct (crid) = A
f1606_03.pct (crid) = A :: s1606_03.pct (crid) = A
f1607_08.pct (crid) = A :: s1607_08.pct (crid) = A
f1629_08.pct (crid) = L :: s1629_08.pct (crid) = L
f1634_09.pct (crid) = L :: s1634_09.pct (crid) = L
f1635_02.pct (crid) = L :: s1635_02.pct (crid) = L
f1639_06.pct (crid) = A :: s1639_06.pct (crid) = A
f1663_08.pct (crid) = L :: s1663_08.pct (crid) = L
f1669_03.pct (crid) = R :: s1669_03.pct (crid) = R
f1674_02.pct (crid) = L :: s1674_02.pct (crid) = L
f1679_09.pct (crid) = T :: s1679_09.pct (crid) = T
f1682_05.pct (crid) = R :: s1682_05.pct (crid) = R
f1684_03.pct (crid) = T :: s1684_03.pct (crid) = T
f1689_08.pct (crid) = R :: s1689_08.pct (crid) = R
f1693_08.pct (crid) = L :: s1693_08.pct (crid) = L
f1699_07.pct (crid) = A :: s1699_07.pct (crid) = A
f1702_03.pct (crid) = R :: s1702_03.pct (crid) = R
f1719_02.pct (crid) = A :: s1719_02.pct (crid) = A
f1726_02.pct (crid) = R :: s1726_02.pct (crid) = R
f1729_02.pct (crid) = A :: s1729_02.pct (crid) = A
f1732_04.pct (crid) = R :: s1732_04.pct (crid) = R
f1733_02.pct (crid) = R :: s1733_02.pct (crid) = R
f1736_08.pct (crid) = L :: s1736_08.pct (crid) = L
f1740_07.pct (crid) = T :: s1740_07.pct (crid) = T
f1745_09.pct (crid) = L :: s1745_09.pct (crid) = L
f1748_02.pct (crid) = L :: s1748_02.pct (crid) = L
f1751_08.pct (crid) = A :: s1751_08.pct (crid) = A
f1759_09.pct (crid) = L :: s1759_09.pct (crid) = L
f1763_10.pct (crid) = T :: s1763_10.pct (crid) = T
f1766_08.pct (crid) = A :: s1766_08.pct (crid) = A

f1772_04.pct (crid) = R :: s1772_04.pct (crid) = R
f1773_07.pct (crid) = A :: s1773_07.pct (crid) = A
f1791_03.pct (crid) = R :: s1791_03.pct (crid) = R
f1793_07.pct (crid) = R :: s1793_07.pct (crid) = R
f1801_03.pct (crid) = A :: s1801_03.pct (crid) = A
f1809_08.pct (crid) = T :: s1809_08.pct (crid) = T
f1816_03.pct (crid) = R :: s1816_03.pct (crid) = R
f1817_07.pct (crid) = R :: s1817_07.pct (crid) = R
f1831_08.pct (crid) = L :: s1831_08.pct (crid) = L
f1834_02.pct (crid) = L :: s1834_02.pct (crid) = L
f1836_02.pct (crid) = L :: s1836_02.pct (crid) = L
f1843_10.pct (crid) = L :: s1843_10.pct (crid) = L
f1861_07.pct (crid) = R :: s1861_07.pct (crid) = R
f1862_09.pct (crid) = T :: s1862_09.pct (crid) = T
f1864_07.pct (crid) = A :: s1864_07.pct (crid) = A
f1868_02.pct (crid) = L :: s1868_02.pct (crid) = L
f1878_05.pct (crid) = R :: s1878_05.pct (crid) = R
f1879_02.pct (crid) = R :: s1879_02.pct (crid) = R
f1882_03.pct (crid) = R :: s1882_03.pct (crid) = R
f1885_03.pct (crid) = R :: s1885_03.pct (crid) = R
f1897_07.pct (crid) = L :: s1897_07.pct (crid) = L
f1905_08.pct (crid) = A :: s1905_08.pct (crid) = A
f1916_09.pct (crid) = A :: s1916_09.pct (crid) = A
f1925_03.pct (crid) = T :: s1925_03.pct (crid) = T
f1928_02.pct (crid) = L :: s1928_02.pct (crid) = L
f1931_01.pct (crid) = R :: s1931_01.pct (crid) = R
f1932_09.pct (crid) = T :: s1932_09.pct (crid) = T
f1934_07.pct (crid) = L :: s1934_07.pct (crid) = L
f1945_10.pct (crid) = L :: s1945_10.pct (crid) = L
f1947_07.pct (crid) = A :: s1947_07.pct (crid) = A
f1952_02.pct (crid) = A :: s1952_02.pct (crid) = A
f1953_03.pct (crid) = A :: s1953_03.pct (crid) = A
f1960_06.pct (crid) = T :: s1960_06.pct (crid) = T
f1966_07.pct (crid) = R :: s1966_07.pct (crid) = R
f1969_03.pct (crid) = T :: s1969_03.pct (crid) = T
f1971_04.pct (crid) = T :: s1971_04.pct (crid) = T
f1972_03.pct (crid) = R :: s1972_03.pct (crid) = R
f1975_02.pct (crid) = R :: s1975_02.pct (crid) = R
f1981_08.pct (crid) = T :: s1981_08.pct (crid) = T
f1984_08.pct (crid) = L :: s1984_08.pct (crid) = L
f2000_10.pct (crid) = L :: s2000_10.pct (crid) = L