User Guide for GDCT

Section 1: Introduction_____

About GDCT

Graphical Database for Category Theory was developed in the summers of 1999-2004 with funding from NSERC USRAs, NSERC Discovery grants and Mount Allison University.

This application allows for the creation, editing, and storage of finitely presented categories. Categories can be opened and saved from local files as well as loaded from a specified server. Once a category file is in memory it can be tested for properties of objects and arrows. The tools available in this version of GDCT are listed in Section 4 of the Table of Contents.

This program also allows the display of categories through the use of graph classes that were developed at Auburn University for Visualizing Graphs with Java (VGJ), a tool for graph drawing and graph layout. The original program was heavily modified for displaying categories. It can be found at
http://www.eng.auburn.edu/department/cse/research/graphdrawing/.

Functors between finitely presented categories can also be created and stored. Functors in memory display their domain and codomain categories, and their action is shown by an animated display.

Some of the algorithms used in GDCT were originally developed in A Database of Categories, a C program written by Ryan Gunther and Michael Fleming with supervision by Robert Rosebrugh. This is available at http://mathcs.mta.ca/research/rosebrugh/dbc/. The GDCT application is developed from on Category Theory Database Tools, a Java applet written by Jeremy Bradbury with supervision by Robert Rosebrugh. This program is available at http://mathcs.mta.ca/research/rosebrugh/ctdt/.

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Installation

The most current version of Graphical Database of Category Theory is available for download at http://mathcs.mta.ca/research/rosebrugh/gdct/downloadv30.htm. There are three installation options. The first option is available only to Windows 95/98/NT/2000/XP users. Options two and three are available to users of all platforms.

Option One: Download Compiled Java Source Files and Java Runtime Environment [Windows Only]

This includes source files compiled into a jar file. This setup includes a Java Runtime Environment for Windows 95/98/NT/2000/XP only. This version of the GDCT Setup is ~2 MB in size.

Option Two: Download Compiled Java Source Files

The option includes in the *.jar file and sample files, but does not include the JRE. This option will most likely be used by someone who wants to install GDCT under a Linux or Macintosh environment.

Linux Instructions:
You will need the latest JRE from http://java.sun.com. From the command prompt type "java -jar gdct.jar".

Macintosh Instructions:
You will need to get the MRJ SDK from http://developer.apple.com/java/download/.html. Then run the program JBindery. Enter GDCT for the class name. Under the Class Path tab click "Add *.zip" and then select gdct.jar. This creates a double-clickable file that is equivalent to a Windows *.bat file.

Option Three: Download Java Source Files and Java Developer's Kit

The complete Java source files are available for download and may be modified under the terms of the GNU General Public License, Version 2. This download also includes all necessary help files as well as sample category and functor files. It is available as a *.zip file or as a *.tar.gz file. In order to compile and interpret Java source files, the Java Developers Kit must be downloaded. JDKs are used by an operating system to compile Java source files and interpret Java class files so they can be run on the local machine.

Directory Structure

Upon installation, the Graphical Database for Category Theory, unless changed by the user, will be installed in a directory called GDCT. Inside this directory are the subdirectories cat, cgl, fgl, fun, Help, Images, and Jre1.1. The following files are also located inside the main directory:

  – GDCT.bat: This is the batch file that the user selects to interpret the java archive (jar)
  – GDCT.jar: This is the java archive file that is interpreted by the Java Runtime Environment. This file contains all of the compiled Java source files.
  – GDCT.ico: This is an icon file that is used on any shortcuts to the GDCT application.
  – GDCT.ini: This initialization file contains information regarding internal settings, category graphical settings, functor graphical settings, functor animation settings, server settings, as well as a list of the most recently opened files.

The subdirectories cat and cgl contain sample category files. The subdirectories fun and fgl contain sample functor files.

The subdirectory Help contains all of the help files while the subdirectory Images contains all of the images used by the Java application.
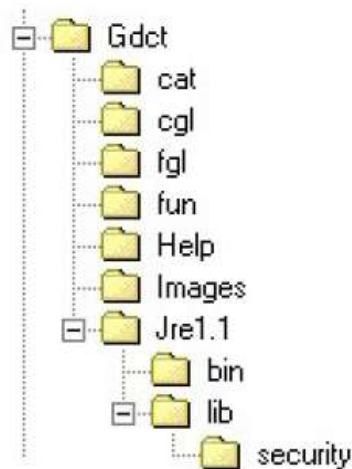
The Jre1.1 subdirectory contains the Java Runtime Environment Version 1.1 which is called by GDCT.bat to interpret the GDCT.jar.

WARNING: The user should not modify any files in the subdirectories Help or Images.