USER GUIDE FOR GDCT

SECTION 1:   INTRODUCTION

About GDCT

Graphical Database for Category Theory was developed in the summer of 1999 under an NSERC summer research grant. 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 under the supervision of Dr. Robert Rosebrugh, and Category Theory Database Tools, written by Jeremy Bradbury under the supervision of Dr. R. Rosebrugh.
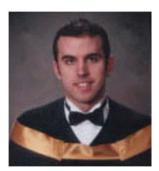
This application allows for the creation, editing, and storage of finitely presented categories. Categories can be opened and saved from local files as well as loaded from a specified server. Once a category file is in memory it can be printed or tools for testing properties of objects and arrows can be applied to it. The tools available in this version of GDCT are Make Confluent, Equality of Composites, Make Dual, Initial Object, Sum, Terminal Object, and Product.

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 also base 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 for Category is available for download at
http://mathcs.mta.ca/research/rosebrugh/gdct/download.htm. There are four installation options. The first two
options are available only to Windows 95/98/NT/2000 users. Options three and four are available to users of
all platforms.

Option One: InstallShield Setup [Windows Only]

Download the InstallShield setup program that will automatically install GDCT for you. This option
is best for user who will require help with initial setup. This setup includes a Java Runtime
Environment for Windows 95/98/NT/2000 only. The InstallShield version of the GDCT Setup is 3.42
MB in size.

Option Two: Non-InstallShield Setup [Windows Only]

Download the non-InstallShield version of the GDCT setup program. For this option the user should
unzip the GDCT.zip file to the desire directory and then run the application from there. This setup
includes a Java Runtime Environment for Windows 95/98/NT/2000 only. The non-InstallShield
version of the GDCT setup program is 2.56 MB. For users who are concerned with download size this
is the best version.

Option Three: Download Compiled Java Source Files and Java Runtime Environment

Under this option, the complete Java source files are already compiled into "class" files and stored in
a java archive ("jar") file. The jar file can be downloaded as a *.zip file as a *.tar.gz file, or in
uncompressed form. This download also includes all necessary help files as well as sample category
and functor files. In order to interpret the compiled code, in the jar file, a Java Run-time Environment
must be downloaded. JREs are used by an operating system to interpret Java class files so that they
can be run on the local machine.

Option Four: 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 that they can be
run on the local machine.

<u>Directory Structure</u>

       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 file (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 GDCT.jar.

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