

Goals

Introduction to OpenGL and GLUT

- to configure your systems for compiling *OpenGL* programs in *C*

For this tutorial...

- an operating system
- a compiler
- the *OpenGL* libraries and development environments

Operating System

- this tutorial assumes *Unix*-like operating system
- *cdf* computers will work
- *Windows* is possible with little modification
 - for example, use *cygwin*

Compiler

- gcc
- already installed on *cdf*
- default on most *Linux* systems
- default with *cygwin*

OpenGL Libraries

- GL – *OpenGL* library
- GLU – *OpenGL* utility library
- glut – *OpenGL* utility toolkit programming interface

Obtaining Libraries

- *cdf* – already installed
- **Debian-like linux** (*GNU/Linux, Ubuntu*, see link for others)
 - use `apt-get` <http://www.debian.org/misc/children-distros>
- *cygwin*
 - use *cygwin* installer
- **Redhat-like systems** (*Redhat, Fedora, Mandrake, SUSE, ...*)
 - use `yum`
 - install `apt-get`

apt

- `apt-cache search criteria`
 - searches for packages matching *criteria*
- `apt-get install package-name`
 - requires *root* privileges
 - installs *package-name*

Makefile

Packages (on my system: Ubuntu)

- xlibmesa-g1
- xlibmesa-g1-dev
- xlibmesa-glu
- xlibmesa-glu-dev
- freeglut3
- freeglut3-dev
- once you know what the packages are, install them using `apt-get install`

```
.PHONEY : run clean

CINCLUDE_DIRS = -I/usr/include/GL
CLIBRARY_DIRS = -L/usr/X11R6/lib
CLIBS = -lGL -lGLU -lglut
OBJECT = tut1.o
TARGET = tut1

# VARIABLES FOR IMPLICIT RULES
CC = gcc
CFLAGS = -Wall $(CINCLUDE_DIRS)
LD_FLAGS = $(CLIBRARY_DIRS) $(CLIBS)

# RULES

run : $(TARGET)
    ./$(TARGET)

$(TARGET) : $(OBJECT)

clean : -rm -f *~ *.o
```

Links

- gl & glu: <http://www.rush3d.com/reference/opengl-bluebook-1.0/>
- glut: <http://www.opengl.org/resources/libraries/glut/spec3/spec3.html>