

## The IRAF Packages

### IRAF Version 2.10

- **clpackage.dataio:**

bintxt	-	Convert a binary file to an IRAF text file
mtexamine	-	Examine the structure of a magnetic tape
rcardimage	-	Convert a cardimage file into a text file
reblock	-	Copy a binary file, optionally reblocking
rfits	-	Convert a FITS image into an IRAF image
rtextimage	-	Convert text files to IRAF images
t2d	-	Fast tape to disk copy
txtbin	-	Convert an IRAF text file to a binary file
wcardimage	-	Convert text files to cardimage files
wfits	-	Convert an IRAF image into a FITS image
wtextimage	-	Convert an IRAF image to a text file

- **clpackage.images:**

blkavg	-	Block average or sum a list of N-D images
blkrep	-	Block replicate a list of images
boxcar	-	Boxcar smooth a list of 1 or 2-D images
chpixtype	-	Change the pixel type of a list of images
convolve	-	Convolve a list of 1 or 2-D images with a rectangular filter
fit1d	-	Fit a function to image lines or columns
fmedian	-	Quantize and median filter a 2-D image or a list of images
fmode	-	Quantize and modal filter a 2-D image or list of images
gauss	-	Convolve a list of 1 or 2-D images with an elliptical Gaussian
geomap	-	Calculate a coordinate transformation
geotran	-	Geometrically transform a set of 2-D images
gradient	-	Convolve a list of 1 or 2-D images with a gradient operator
hedit	-	Header editor
hselect	-	Select a subset of images satisfying a boolean expression
imarith	-	Simple image arithmetic
imcombine	-	Combine images pixel-by-pixel using various algorithms
imcopy	-	Copy an image
imdebug	-	Image debugging package (currently undocumented)
imdelete	-	Delete a list of images
imdivide	-	Image division with zero checking and rescaling
imgets	-	Return the value of an image parameter as a string
imheader	-	Print an image header
imhistogram	-	Compute image histogram
imlintran	-	Linearly transform a list of 2-D images
imrename	-	Rename one or more images
imshift	-	Shift a list of 2-D images
imslice	-	Slice images into images of lower dimension
imstack	-	Stack images into a single image of higher dimension
imstatistics	-	Compute and print statistics for a list of images
imsum	-	Compute the sum, average, or median of a set of images
imsurfit	-	Fit a surface to a 2-D image
imtranspose	-	Transpose a 2-D image
laplace	-	Laplacian filter a list of 1 or 2-D images
lineclean	-	Replace deviant pixels in image lines
listpixels	-	Convert an image section into a list of pixels

magnify	-	Magnify a list of 1-D or 2-D images
median	-	Median filter a 2-D image or list of images
minmax	-	Compute the minimum and maximum pixel values in an image
mode	-	Modal filter a 2-D image or list of images
register	-	Register a set of images
rotate	-	Rotate and shift a list of 2-D images
sections	-	Expand an image template on the standard output
shiftnines	-	Shift image lines
tv	-	Image display load and control package

• **clpackage.images.tv:**

display	-	Load an image or image section into the display
iis	-	IIS image display control package
imedit	-	Examine and edit pixels in images
imexamine	-	Examine images using image display, graphics, and text
tvmark	-	Mark objects on the image display
wcslab	-	Overlay a displayed image with a world coordinate grid

• **clpackage.images.tv.iis:**

blink	-	Blink two frames
cv	-	Control image device, display "snapshot"
cvl	-	Load image display (newer version of 'display')
erase	-	Erase an image frame
frame	-	Select the frame to be displayed
lumatch	-	Match the lookup tables of two frames
monochrome	-	Select monochrome enhancement
pseudocolor	-	Select pseudocolor enhancement
rgb	-	Select true color mode (red, green, and blue frames)
window	-	Adjust the contrast and dc offset of the current frame
zoom	-	Zoom in on the image (change magnification)

• **clpackage.language:**

intro	-	A brief introduction to IRAF
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Language components:

break	*	Break out of a loop
case	*	One setting of a switch
commands	-	A discussion of the syntax of IRAF commands
cursors	-	Graphics and image display cursors
declarations	-	Parameter/variable declarations
default	*	The default clause of a switch
else	*	Else clause of IF statement
for	*	C-style for loop construct
if	*	If statement
goto	*	Goto statement
logging	-	Discussion of CL logging
next	*	Start next iteration of a loop
parameters	-	Discussion of parameter attributes
procedure	*	Start a procedure script
return	*	Return from script with an optional value

switch \* Multiway branch construct  
while \* While loop

Builtin Commands and Functions:

access - Test if a file exists  
back - Return to the previous directory (after a chdir)  
beep - Send a beep to the terminal  
bye - Exit a task or package  
cache - Cache parameter files, or print the current cache list  
cd - Change directory  
chdir - Change directory  
cl - Execute commands from the standard input  
clbye - A cl followed by a bye (used to save file descriptors)  
clear - Clear the terminal screen  
defpac - Test if a package is defined  
defpar - Test if a parameter is defined  
deftask - Test if a task is defined  
dparam - Dump a pset as a series of task.param=value assignments  
edit - Edit a text file  
ehistory - Edit history file to re-execute commands  
envget - Get the string value of an environment variable  
eparam - Edit parameters of a task  
error - Print error code and message and abort  
flprcache - Flush the process cache  
fprint \* Print a line into a parameter  
fscan \* Scan a list  
gflush - Flush any buffered graphics output  
hidetask - Make a task invisible to the user  
history - Display commands previously executed  
jobs - Display status of background jobs  
keep - Make recent set, task, etc. declarations permanent  
kill - Kill a background job  
logout - Log out of the CL  
lparam - List the parameters of a task  
mathfns - Mathematical routines  
mktemp - Make a temporary (unique) file name  
osfn - Return the host system equivalent of an IRAF filename  
package - Define a new package, or print the current package names  
prcache - Show process cache, or lock a process into the cache  
print - Format and print a line on the standard output  
putlog - Put a message to the logfile  
radix - Encode a number in the specified radix  
redefine - Redefine a task  
reset - Reset the value of an environment variable  
scan \* Scan the standard input  
service - Service a query from a background job  
set - Set an environment variable  
show - Show an environment variable  
sleep - Hibernate for a specified time  
strings - String manipulation routines  
stty - Set/show terminal characteristics  
task - Define a new task  
time - Print the current time

- unlearn - Restore the default parameters for a task or package
- update - Update a task's parameters (flush to disk)
- wait - Wait for all background jobs to complete

• **clpackage.lists:**

- average - Compute the mean and standard deviation of a list
- columns - Convert multicolumn file to separate files
- lintran - Perform linear transformation of a list
- rgcursor - Read the graphics cursor (makes a list)
- rimcursor - Read the image display cursor (makes a list)
- table - Format a list of words into a table
- tokens - Break a file up into a stream of tokens
- unique - Delete redundant elements from a list
- words - Break a file up into a stream of words

• **clpackage.obsolete:**

- intitle - Change the title of an image (noao.proto V2.9)
- mkhistogram - List or plot the histogram of a data stream (noao.proto V2.9)
- oimcombine - Combine images (images.imcombine V2.9)
- radplot - PLOt the radial profile of an object (noao.proto V2.9)

The previous package and release is listed in parenthesis

• **clpackage.plot:**

- calcomp - Plot metacode on a Calcomp pen plotter
- contour - Make a contour plot of an image
- crtplot - Generate greyscale plots of IRAF images
- gdevices - List available imaging or other graphics devices
- gkidecode - Decode metacode on the standard output
- gkdir - Directory listing of metacode file
- gkiextract - Extract individual frames from metacode file
- gkimosaic - Condense metacode frames to fit on one page
- graph - Graph one or more image sections or lists
- hafton - Generate half-tone plots of an image
- imdkernel - Image display device (IMD) graphics kernel
- implot - Plot lines and columns of images using cursors
- nsppkernel - Plot metacode on a NSPP (NCAR) plotter device
- pcol - Plot a column of an image
- pcols - Plot the average of a range of image columns
- phistogram - Plot or print the histogram of an image or list
- pradprof - Plot or list the radial profile of a stellar object
- pro - Plot a line (row) of an image
- prows - Plot the average of a range of image lines
- pvector - Plot an arbitrary vector in a 2D image
- sgidecode - Decode an SGI format metacode file
- sgikern - Simple graphics interface (SGI) graphics kernel
- showcap - Show and decode graphcap entries
- stdgraph - Plot metacode on the standard graphics device
- stdplot - Plot metacode on the standard plotter device
- surface - Make a surface plot of an image
- velvect - Plot representation of a velocity field

- **clpackage.proto:**

binfil	-	Create a binary file from an IRAF image
bscale	-	Linearly transform the intensities of a list of images
epix	-	Edit pixels in an image
fields	-	Extract specified fields from a list
fixpix	-	Fix bad pixels by linear interpolation from nearby pixels
hfix	-	Fix image headers with a user specified command
imalign	-	Register and shift a list of images
imcentroid	-	Compute relative shifts for a list of images
imcntr	-	Locate the center of a stellar image
imfunction	-	Apply a function to the image pixel values
imreplace	-	Replace pixels in a range by a constant
imscale	-	Scale an image to a specified (windowed) mean
interp	-	Interpolate for a value in a table of X,Y pairs
irafil	-	Create an IRAF image from a binary data file
joinlines	-	Join text files line by line
suntoiraf	-	Convert Sun rasters into IRAF images
wcsedit	-	Edit the image coordinate system
wcsreset	-	Reset the image coordinate system

- **clpackage.softools:**

generic	-	Preprocess a generic source file
hdbexamine	-	Examine a help database
lroff	-	Lroff (line-roff) text formatter
mkhelpdb	-	Make (compile) a help database
mkmanpage	-	Make a manual page
mkpkg	-	Make or update an object library or package
mktags	-	Tag all procedure declarations in a set of files
mkttydata	-	Build cache for termcap/graphcap device entries
rmbin	-	Find/delete binary files in subdirectories
rmfiles	-	Find/delete files in subdirectories
rtar	-	Read a TAR format archive file
wtar	-	Write a TAR format archive file
xc	-	Compile and/or link a program
xyacc	-	Build an SPP language parser

- **clpackage.system:**

allocate	-	Allocate a device, i.e., magtape drive mta, mtb, ...
concatenate	-	Concatenate a list of files
copy	-	Copy a file or files (use IMCOPY for imagefiles)
count	-	Count the number of lines, words, characters in a text file
deallocate	-	Deallocate a previously allocated device
delete	-	Delete a file or files (use IMDELETE to delete imagefiles)
devices	-	Print information on the locally available devices
devstatus	-	Print the status of a device (mta, mtb, ...)
directory	-	List the files in a directory
diskspace	-	Show how much disk space is available
files	-	Expand a file template into a list of files
gripes	-	Send suggestions, complaints, etc. to the system
head	-	Print the first few lines of a text file
help	-	Print online documentation

lprint	-	Print a file on the line printer device
match	-	Print all lines in a file that match a pattern
mkdir	-	Create a new directory
mkscript	-	Make a command script
movefiles	-	Move files to a directory
netstatus	-	Print the status of the local network
news	-	Page through the system news file
page	-	Page through a file
pathnames	-	Expand a file template into a list of OS pathnames
phelp	-	Paged HELP: collects and pages the output of HELP
protect	-	Protect a file from deletion
references	-	Find all help database references for a given topic
rename	-	Rename a file
rewind	-	Rewind a device (magtape)
sort	-	Sort a text file
spy	-	Show processor status
tail	-	Print the last few lines of a file
tee	-	Tee the standard output into a file
type	-	Type a text file on the standard output
unprotect	-	Remove delete protection from a file

• **clpackage.utilities:**

curfit	-	Fit data with Chebyshev, Legendre or spline curve
detab	-	Replace tabs with tabs and blanks
entab	-	Replace blanks with tabs and blanks
lcase	-	Convert a file to lower case
polyfit	-	Fit polynomial to list of X,Y data
split	-	Split a large file into smaller segments
translit	-	Replace or delete specified characters in a file
ucase	-	Convert a file to upper case
urand	-	Uniform random number generator

Note: Language package keywords are starred. To get help on a keyword enclose it in quotes.