Maxima

C. Schiff - 11/22/10

File Loading

To load a file use either full path version, such as `load("c:/work2/qxxx.mac")`, or the brief version, such as `load(qxxx.mac)`. For the brief version to work the file `qxxx.mac` needs to be placed in one of the folders Maxima searches by default, or else, Maxima must be directed to search the desired directory. To determine which directories Maxima searches by default, a query at the prompt, of `file_search_maxima`. To add to the default path, put a line like:

```
file_search_maxima : append(["c:/work2/###.{mac,mc}"], file_search_maxima )$
```

and likewise with `maxima` replaced by `lisp` in the personal startup file `maxima-init.mac`. The file `maxima-init.mac` is located somewhere like (type `maxima_userdir` to see): `c:\users\cschiff\maxima\maxima-init.mac`.

Directory Commands

opendir:	opendir(DIR,$dir_path) opens the directory specified by $dir_path, assigns a directory handle DIR is possible (return of *true*) or returns *false*
readdir:	@files = readdir(DIR); puts a list of files in the directory handle specified by DIR. *Note:* that @files includes the directories '.' and '..'
closedir:	closedir(DIR) closes the directory specified by the directory handle DIR
system:	system("dir") run a system command with a $string = "dir" or system(@command) where @command is a list of strings

Misc. Commands

`ctrl-q`	quits Maxima
`ctrl-r`	Evaluates all cells
`<command>$`	runs command and supresses `%o<n>` output
`ratsimp`	perform rational simplification (once)
`fullratsimp`	perform rational simplification (stops when no change occurs)
`rat`	puts an expression into CRE (Canonical Rational Expression)
`/*<text>*/`	Insert a comment in file or cell
`apropos("foo")`	returns list of core Maxima names which have `foo` within them
`describe("e",<tag>)`	prints to screen a numbered list of all items which contain `"e"` as part of their name. The `<tag>` can be `exact` or `inexact` which defaults to `exact` if `<tag>` is ommitted
`kill`	`kill(a,b)` will eliminate objects `a` and `b`
`ev`	`ev ( expr, options )` (or `expr, options` for the interactive version) evaluates the expression `expr` in the environment specified by the arguments `arg_1, ..., arg_n`. The arguments are switches, assignments, equations, and functions.
`evflag`	A symbol `x` has the evflag property, the expressions `ev(expre, x)` are equivalent to `ev(expr, x = true)`.
`evflag` options	`algebraic, cauchysum, demoivre, dotscrules, %emode, %enumer, exponentialize, exptisolate, factorflag, float, halfangles, infeval, isolate_wrt_times, keepfloat, letrat, listarith, logabs, logarc, logexpand, lognegint, lognumer, m1pbranch, numer_pbranch, prgrammode, radexpand, ratalgdenom, ratfac, ratmx, ratsimpexpons, simp, simpsum, sumexpand, and trigexpand.`
`evfun`	
`properties`	gives the properties of any expression
`declare`	
`fundef`	
`values`	
`map`	sgsgds
`fullmap`	
`apply`	
`subst`	
`ratsubst`	
`part`	
`substpart`	
`coeff`	
`ratcoef`	

FreeFlyer

C. Schiff - 1/28/08

Ephemeris Object

Object Representation

Parameter	*Values*	*Explanation*
Name	“Ephemeris”	String denoting the object name
CentralBody	“Earth”	Central body as origin
StepSize	0 *or* # > 0	0 variable step # > 0 fixed step
Branch	????	????
WritePosVel	Record position and velocity	‘0’ off ‘1’ on
WriteAcceleration	Record accelerations (derived from what)	‘0’ off ‘1’ on
WriteAttitude	Record attitude (what parametrization)	‘0’ off ‘1’ on
WriteAngularVelocity	Record attitude rates (what parametrization)	‘0’ off ‘1’ on
WriteAngularAcceleration	Record ‘torque’ (what parametrization)	‘0’ off ‘1’ on

Create

Create Ephemeris ephem_name;

Putting a SC to an Ephem

Put SC to Ephem;
Put SC to Ephem as Global;

Ephem to Disk

Put Ephem to FFephem “<path >\<filename >”;
Put Ephem to STKephem “<path >\<filename >”;
Put Ephem to PCephem “<path >\<filename >”;
Put Ephem to PCephem “<path >\<filename >” with StepSize = 60 and CS as J2000 or TOD;
Put Ephem to ephem “<path >\<filename >” with StepSize = 60 and CS as J2000 or TOD;

where:
FFephem - flat ASCII file in native FF format
STKephem - flat ASCII file in native STK format
PCephem - Code 500 binary file (little endian)
ephem - Code 500 binary file (big endian)

Dynamic Ephemeris Naming

- Create String eph_name
- Create UserInterface my_gui
  - ·my_gui.NumberOfInputs = 1;
  - ·my_gui.ObjectNameToDisplay = “”;
  - ·my_gui.ContinueButtonLabel = “Continue”;
  - ·my_gui.ExplicitEdit (0) = 0;
  - ·my_gui.ParameterLabel (0) = “Input Ephem Name”;
  - ·my_gui.DefaultValue (0) = “”;
  - ·my_gui.MinimumRange (0) = 999;
  - ·my_gui.MaximumRange (0) = -999;
  - ·my_gui.Units (0) = “”;
  - ·my_gui.ParameterName (0) = “eph_name.Value”;
  - ·my_gui.EntryType (0) = “Enter Value”;
  - ·my_gui.FormatString (0) = “”;
- Create Ephemeris ephem;
- Create Spacecraft SC using ephem;
- Show my_gui; *//gets string via UserInterface into eph_name*
- Get ephem from FFephem eph_name;