Tailoring MasterScope

Extending analysis of functions

MasterScope maintains a number of tables describing how (analyzed) functions relate to other objects. The template keywords **TEST**, **PROP**, **FUNCTION**, etc. corespond to some of these tables. For a number of applications, the user would like to be able to define new template words and the database tables that go along with them.

(ADDTEMPLATEWORD WORD) [Function]

defines a new table to hold a new MasterScope relation. The name of the table will be **WORD**, and **WORD** can be used in function templates. This is a new function.

Functions are also provided to allow the user to access these new tables inside of a MasterScope command.

(MSADDRELATION RELATION TABLES) [Function]

defines a new relation for MasterScopes parser and command interpreter. For example, **(MSADDRELATION '(FETCH FETCHES FETCHING FETCHED))** could have been used to define the **FETCH** relation.

RELATION is a list of **ROOT PRESENT PARTICIPLE** and **PAST** conjugations of the new relation. **TABLES** is a list of MasterScope database tables that will be **UNION**ed to compute the new relation. (If **TABLES** is an atom it will be coerced to a list containing that atom. If the tables do not already exist, they will automatically be created by **ADDTEMPLATEWORD**). **TABLES** defaults to the **ROOT** of the relation.

(MSADDMODIFIER RELATION MODIFIERS TABLES) [Function]

defines a new modifier for the given relation. For example, the phrase **SET FREE** could have been defined by **(MSADDMODIFIER 'SET 'FREE '(SETFREE))**.

RELATION is a known MasterScope relation (either built-in or defined by **MSADDRELATION** above). **MODIFIERS** is a list of equivilent modifiers. **TABLES** is a list of MasterScope database tables that should be **UNION**ed to compute the new, modified relation. (If any of the tables do not exist, they will be created by **ADDTEMPLATEWORD**). This is a new function.

(MSADDTYPE TYPE TABLES HOWUSED SYNONYMS) [Function]

tells MasterScope what it means to use an object of a given type. The phrase **USE THE FIELD** could be defined by **(MSADDTYPE 'FIELD '(FETCH REPLACE) '(USE FETCH REPLACE))**.

TYPE is the type of the object being described. The word **TYPE** can then be used in MasterScope commands. **TABLES** indicates how the relation **USE THE <TYPE> ...** is defined. **HOWUSED** is a list of verb describing how the type can be used. The above example not only lets you use the phrase **USE THE FIELD**, but also the phrases **FETCH THE FIELD** and **REPLACEUSE THE FIELD**. The default value of **HOWUSED** is **(USE)**. Finally, **SYNONYMS** is a list of synonyms for **TYPE**.

In addition to these new functions there are a number of other ways to tailor MasterScope.

Some MasterScope templates, for example **(IF expression template$_1$ template$_2$)** can compute the template to be used. These expressions can access the current form via the free variable **EXPR**. The free variable **PARENT** can be used to access the expression that contains the current expression. This has existed all along, but has not been documented.

ANALYZEUSERFNS [Variable]

is a list each of whose elements is a function that will be **APPLY***ed to the name, definition, and the results of the MasterScope analysis of a function whenever it is analyzed. The result of each application becomes the new result of the MasterScope analysis.

The results of the MasterScope analysis is an ALIST associating relations (**BIND**, **CALL**, etc) with the coresponding data for the function. This can be used to compute relations that are determined by some global context. This has existed all along, but has not been documented.

(SETSYNONYM PHRASE MEANING -) [Function]

defines a new synonym for MasterScope's parser. Both **MEANING** and **PHRASE** are lists of words; anywhre **PHRASE** is seen in a command, **MEANING** will be substituted. For example, **(SETSYNONYM 'GLOBALS '(VARS IN GLOBALVARS OR @(GETPROP X 'GLOBALVAR))** would allow the user to refer with the single word **GLOBALS** to the set of variables which are either in **GLOBALVARS** or have a **GLOBALVAR** property.

SETSYNONYM includes a small pattern match ability. A **&** in **PHRASE** will match any word; the word will be substitued for **N** in **MEANING** where **N** is the number of **&**'s which have been matched. For example, **(SETSYNONYM '(FOO & &) '(IN 1 OR ON 2))** will take **FOO FIE FUM** into **IN FIE OR ON FUM**. This is an old function, but the documentation (IRM p 13.20) was incompletežspecifically the pattern match stuff was not mentioned.

Extending MasterScope commands

DESCRIBELST [Variable]

is a list each of whose elements is a list containing a descriptive string and a form. The form is evaluated (it can refer to the name of the function being described by the free variable **FN**); if it returns a non-**NIL** value, the description string is printed followed by the value. If the value is a list, its elements are printed with commas between them. For example, the entry **("types: " (GETRELATION FN '(USE TYPE) T)** would include a listing of the types used by each function. From the IRM, p 13.7.

MSCHECKFNS [Variable]

is a list of functions that will be used to extend the **CHECK** MasterScope command. The **CHECK** command will **APPLY*** each function on **MSCHECKFNS** to the list of files being checked. This is new.

Analyzing new types of objects

This doesn't work yet.

(MSADDANALYZE PLURAL SINGULAR ANALYZEFN RELATIONS) [Function]

defines a new type for MasterScope analysis. For example, **(MSADDANALYZE 'CLASSES 'CLASS 'AnalyzeClass ??)** will let you execute MasterScope commands like **. ANALYZE ANY CLASS ON 'MYFILE** and **. WHAT CLASS DEFINES THE IV foo**. The function **ANALYZEFN** should be a function of two arguments, the item name and the flag **REANALYZE?**, and should return an ALIST associating relation names to coresponding data for the object. This is a new function.

Need to do

(DUMPDATABASE) needs to store out all the new words, relation, etc.

Analyzing new types of things needs to store the info someplace, and **ERASE** needs to be able to find it.

Need a **FILEPKGTYPE** for the MasterScope words.