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4.7 Utility Routines

This section lists the most important CFITSIO general utility routines.

```
int fits_write_chksum( fitsfile *fptr, int *status)
int fits_verify_chksum(fitsfile *fptr, int *dataok, int
*hduok, int *status)
```

These routines compute or validate the checksums for the current HDU. The **DATASUM** keyword is used to store the numerical value of the 32-bit, 1's complement checksum for the data unit alone. The **CHECKSUM** keyword is used to store the ASCII encoded **COMPLEMENT** of the checksum for the entire HDU. Storing the complement, rather than the actual checksum, forces the checksum for the whole HDU to equal zero. If the file has been modified since the checksums were computed, then the HDU checksum will usually not equal zero.

The returned **dataok** and **hduok** parameters will have a value = 1 if the data or HDU is verified correctly, a value = 0 if the **DATASUM** or **CHECKSUM** keyword is not present, or value = -1 if the computed checksum is not

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correct.

```
int fits_parse_value(char *card, char *value, char
*comment, int *status)
int fits_get_keytype(char *value, char *dtype, int *status)
int fits_get_keyclass(char *card)
int fits_parse_template(char *template, char *card, int
*keytype, int *status)
```

fits_parse_value parses the input 80-character header keyword record, returning the value (as a literal character string) and comment strings. If the keyword has no value (columns 9-10 not equal to '= '), then a null value string is returned and the comment string is set equal to column 9 - 80 of the input string.

fits_get_keytype parses the keyword value string to determine its datatype. **dtype** returns with a value of 'C', 'L', 'I', 'F' or 'X', for character string, logical, integer, floating point, or complex, respectively.

fits_get_keyclass returns a classification code that indicates the classification type of the input keyword record (e.g., a required structural keyword, a TDIM keyword, a WCS keyword, a comment keyword, etc. See the CFITSIO Reference Guide for a list of the different classification codes.

fits_parse_template takes an input free format keyword template string and returns a formatted 80*char record that satisfies all the FITS requirements for a header keyword record. The template should generally contain 3 tokens: the keyword name, the keyword value, and the keyword comment string. The returned **keytype** parameter indicates whether the

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keyword is a **COMMENT** keyword or not. See the **CFITSIO Reference Guide** for more details.

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