"Comments" In SPICE Kernels

Also known as "meta-data"

January 2017
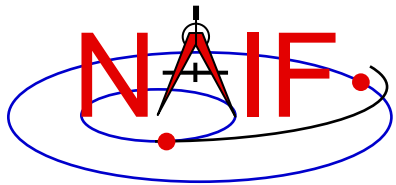
What are Comments?

- **Comments, also called "meta-data," are information that describe the context of kernel data, i.e. "data about data"**
- **Comments are provided inside kernels as plain text (prose)**
- **Examples of comments:**
  - **Data descriptions**
    - » **"This file contains representations of the trajectories for bodies X, Y and Z over the interval from launch to landing"**
  - **Data accuracy**
  - **Data pedigree**
    - » **How and by whom the kernel was created**
      - **The program(s) and/or steps used in creation**
      - **Contact information for user's questions**
        - **email address**
        - **phone numbers**
    - » **Data sources used as inputs when creating the kernel**
  - **Intended kernel usage**
  - **Companion files**
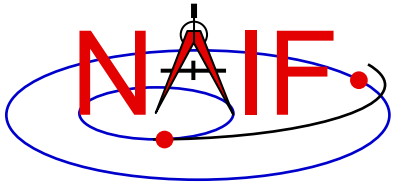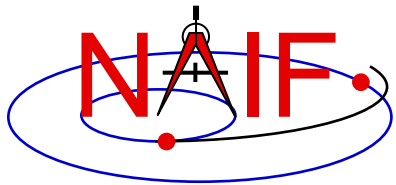
Where are Comments Stored?

- **Binary kernels contain a reserved "comment area" to hold comments**

- **Text kernels have comments interleaved with the data**
  - **Comments may be placed at the beginning of the text kernel, before any data**
  - **Comments may be inserted between blocks of data using `\begintext` and `\begindata` as start and end markers:**
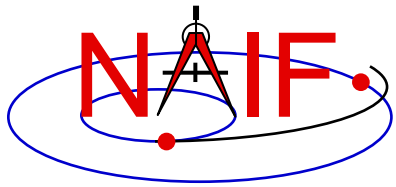
```
\begintext

  Some comments

\begindata

  Some data
```

Adding Comments to Kernels

- **Binary Kernels**
  - **Use the *commnt* utility program, available in the Toolkit**
  - **Include comment information at the time of kernel creation using SPICE APIs (subroutines)**
    - » **This capability is not yet available in Mice**

- **Text Kernels**
  - **Use a text editor**
    - » **Begin comment sections with the "`\begintext`" marker alone on a line**
      - • **(The marker is not needed for comments placed at the beginning of a text kernel)**
    - » **End comment sections with a "`\begindata`" marker alone on a line**
      - • **(The marker is not needed if there are no data following the comments)**

- **Restrictions**
  - **For both binary and text kernels**
    - » **Comment line length limit is 255 characters. However, NAIF recommends using no more than 80 characters per line as this makes your comments far more readable!**
    - » **Use only printing characters (ASCII 32 - 126)**
    - » **Manipulating binary kernel comments requires the kernel be in the native binary format for the machine being used**
  - **For text kernels**
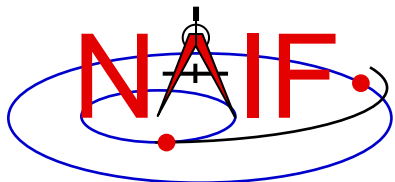   - » **Refer to "Kernel Required Reading" (*kernel.req)* for details**

Navigation and Ancillary Information Facility

- **Binary kernels:**
  - **Use either the *commnt* or *spacit* utility program**
    - » **Both are available in all Toolkits**

- **Text kernels:**
  - **Use any available text file utility, such as:**
   - » **more, cat, vi, emacs**
    - » **Notepad, TextEdit, BBEdit, Word, etc.**

Navigation and Ancillary Information Facility

This example shows reading the comments in an SPK file using the "commnt" utility program

```
Terminal Window                                                    ⊠

Prompt> commnt -r de421.bsp | more


...

DE 421 JPL Planetary Ephemeris SPK
==================================

Original file name:  de421.bsp
Creation date:       Feb. 13, 2008
File created by:     Dr. William Folkner (SSD/JPL)
Comments added by:   Nat Bachman (NAIF/JPL)

This SPK file was released on February 13, 2008 by the Solar System
Dynamics Group of JPL's Guidance, Navigation, and Control section.

The DE 421 planetary ephemeris is described in JPL IOM 343R-08-002,
dated Feb. 13, 2008. The introduction of that memo states, in part,
that this ephemeris "represents an overall update for all

--More--
```
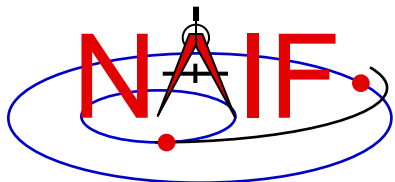
Viewing Comments in Text Kernels

Navigation and Ancillary Information Facility

This example show use of the unix "more" processor to show some of the comments at the beginning of the text kernel.

```
Terminal Window                                          ☒

prompt> more naif0008.tls

KPL/LSK

LEAPSECONDS KERNEL FILE
===========================================================

Modifications:
--------------
2005, Aug. 3  NJB   Modified file to account for the leapsecond
                    that will occur on December 31, 2005.

1998, Jun 17  WLT   Modified file to account for the leapsecond
                    that will occur on December 31, 1998.

1997, Feb 22  WLT   Modified file to account for the leapsecond
                    that will occur on June 30, 1997.



…etc.

 -More--(19%)
```