SAO Catalog

Catalog Specifications

The SAO2000 catalog will be ingested into two separate tables, sao1950 and sao2000. Sao1950 contains supplemental details such as flags and 1950's data while the sao2000 table contains data from 2000's measurements. In addition, the following requirements will be followed for database ingestion:

- Keep consistent UNITS.
- Confirm proper motion in "/yr.
- RA and DEC in both sexagesimal and degrees (6 sig figures)
    - this is to avoid the need for translation later.
- Check for values to be replaced with null.
    - Set null floats for values like magnitude and proper motion.
    - Remove any null coordinates.
- Look at how to read the file and ingest into DB.
- Look into providing search indexes to improve performance.

Tables

sao2000			
ColumnName	**Datatype**	**Units**	**NullValues**
SaoNumber	INT	id	-
RA	VARCHAR(13)	sexag	-
PMRA	FLOAT	mas/yr	Blank
Decl	VARCHAR(13)	sexag	-
PMDec	FLOAT	mas/yr	Blank
RA_rad	FLOAT	rad	-
Decl_rad	FLOAT	rad	-
RA_deg	FLOAT	deg	-
Decl_deg	FLOAT	deg	-
PhotMag	FLOAT	mag	99.9
VMag	FLOAT	mag	99.9
SpectralType	VARCHAR(3)	-	-
VMag_delta	FLOAT	-	-
PhotMag_delta	FLOAT	-	-

sao1950			
ColumnName	Datatype	Units	NullValues
SaoNumber	INT	id	-
Dup	VARCHAR(1)	-	Blank
RA1950	VARCHAR(14)	sexag	-
PMRA_1950	FLOAT	mas/yr	Blank
PMRA_1950mu	FLOAT	µas/yr	-
RA2m_flag	VARCHAR(1)	-	Blank
RA1950_precessed	FLOAT	-	-
RA1950_precessed_sd	FLOAT	-	-
Original_Epoch	FLOAT	yr	-
Dec1950	VARCHAR(14)	sexag	-
PMDec_1950	FLOAT	mas/yr	Blank
PMDec_1950mu	FLOAT	µas/yr	-
D2m_Flag	VARCHAR(1)	-	Blank
DE2s	FLOAT	-	-
e_DE2	FLOAT	-	-
Dec_orig_epoch	FLOAT	yr	-
e_Pos	FLOAT	-	-
VMag_src	INT	-	99.9
StarNum_src	INT	-	-
PhotMag_src	INT	-	99.9
PM_src	INT	-	-
SpecType_src	INT	-	-
Rem	INT	-	-
SrcCatCode	INT	-	-
SrcCatNum	INT	-	-
DurchmusterungID	VARCHAR(14)	-	-
HenryDraperCatNum	VARCHAR(6)	-	-
HDDuplicateID	VARCHAR(1)	-	-
GeneralCatalogNumber1950	VARCHAR(5)	-	-
RA1950_rad	FLOAT	rad	-
Dec1950_rad	FLOAT	rad	-

Figures 1.1 & 1.2: Name, SQL Datatype, Units and Values to be replaced with NULL for the sao2000 and sao1950 tables.

Database Implementation

- The sao.dat file contains all the columns necessary to implement the catalog specific changes and create the database.
- First, each line in the file was split by byte into the defined columns in the readme document.
- Next, each column was assigned a SQL datatype (defined in the sao1950 and sao2000 tables above), and proper units for each column were defined.
- For consistency, proper motion, RA, and Declination units were not changed.
- Finally, the catalog was updated to include NULL instead of blank values for magnitudes, and the three stars that did not have a proper motion value defined were given proper motion values of zero.
- The final specification of the Sao catalog was to explore adding precession and creating an RA and Declination coordinate for 2020. This was not implemented due to the variance in Proper Motion over time.

Data Cleaning

- RA: Right Ascension in sexagesimal constructed from degree values
- Decl: Declination in sexagesimal constructed from degree values.
- Decl_deg: Converted Decl to degrees
- RA_deg: Converted RA to degrees
- RA_1950: Right Ascension in sexagesimal constructed from degree values.
- Dec_1950: Declination in sexagesimal constructed from degree values.
- Columns where NULL values were added:
    - PMDec
    - PMRA
    - Dup
    - RA2m_Flag
    - D2m_Flag
    - HDDuplicateID
    - PMRA_1950
    - PMDec_1950