GSC240 Catalog

Catalog Specifications

- Keep consistent units.
- Confirm proper motion in "/yr.
- RA and DEC in both sexagesimal, radians, 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.
    - How is the file indexed, data split between files, etc.
- Determine the Schema for the columns from the readme file.
- Create search indexes for RA, DECL, RA_deg, Decl_deg, RMag to improve performance.
- Four tables: gsc240 and gsc240_errors_flags & gsc240_not_visible and gsc240_errors_flags_not_visible
    - _not_visible: Not visible from Keck Observatory Declination < -70°
- Check database vs existing file query structure.

Tables

gsc240

ColumnName	Datatype	Units	NullValues
HSTid	VARCHAR(11)	id	-
GSC1id	VARCHAR(11)	id	-
GSCid	INT	id	-
RA	VARCHAR(13)	sexag	-
Decl	VARCHAR(13)	sexag	-
RA_rad	DOUBLE	rad	-
Decl_rad	DOUBLE	rad	-
RA_deg	DOUBLE	deg	-
Decl_deg	DOUBLE	deg	-
Original_Epoch	DOUBLE	yr	-
RA_eps	DOUBLE	arcsec	-
Decl_eps	DOUBLE	arcsec	-
PmRA	DOUBLE	mas/yr	99.9
PmDec	DOUBLE	mas/yr	99.9
Delta_Epoch	DOUBLE	yr	-
FpgMag	DOUBLE	mag	99.9
JpgMag	DOUBLE	mag	99.9
VMag	DOUBLE	mag	99.9
NpgMag	DOUBLE	mag	99.9
UMag	DOUBLE	mag	99.9
BMag	DOUBLE	mag	99.9
RMag	DOUBLE	mag	99.9
IMag	DOUBLE	mag	99.9
JMag	DOUBLE	mag	99.9
HMag	DOUBLE	mag	99.9
KMag	DOUBLE	mag	99.9
Classification	INT	-	-
SemiMajorAxis	DOUBLE	-	-
Eccentricity	DOUBLE	-	-
PositionAngle	DOUBLE	deg	-
SourceStatus	INT	-	-

gsc240_errors_flags

ColumnName	Datatype	Units	NullValues
HSTid	VARCHAR(11)	id	-
GSC1id	VARCHAR(11)	id	-
GSCid	INT	id	-
PmRA_mu	DOUBLE	mas/yr	99.9
PmDec_mu	DOUBLE	mas/yr	99.9
FpgMag_err	DOUBLE	mag	99.9
FpgMag_code	INT	-	99
JpgMag_err	DOUBLE	mag	99.9
JpgMag_code	INT	-	99
VMag_err	DOUBLE	mag	99.9
VMag_code	INT	-	99
NpgMag_err	DOUBLE	mag	99.9
NpgMag_code	INT	-	99
UMag_err	DOUBLE	mag	99.9
UMag_code	INT	-	99
BMag_err	DOUBLE	mag	99.9
BMag_code	INT	-	99
RMag_err	DOUBLE	mag	99.9
RMag_code	INT	-	99
IMag_err	DOUBLE	mag	99.9
IMag_code	INT	-	99
JMag_err	DOUBLE	mag	99.9
JMag_code	INT	-	99
HMag_err	DOUBLE	mag	99.9
HMag_code	INT	-	99
KMag_err	DOUBLE	mag	99.9
KMag_code	INT	-	99
VariableFlag	INT	-	-
MultipleFlag	INT	-	-

Figures 3.1 & 3.2: Name, SQL Datatype, Units and Values to be replaced with NULL for the gsc240 and gsc240_errors_flags tables.

Database Implementation

- The GSC240 database was constructed from ~648,000 zone files, each corresponding to a 0.1 by 1-degree zone in the sky.
- Some files have zero stars and are not included in the catalog's csv file.
- 33,468,364 Not visible and 910,107,671 Visible Stars
- Files are stored in nested folders with the following folder structure:
    - *Degree of Dec*/*Decimal Degree of Dec*/*Degree of RA*
    - Ex: 000/0000/001 is the file corresponding to the -90 to -89.9° Dec by 0° to 1° RA.

Data Cleaning

- RA (sexagesimal) was constructed from the RA_deg column.
- RA_deg (degrees) was constructed from the original RA column.
- Decl (sexagesimal) was constructed from the Decl_deg column.
- Errors and magnitudes were checked for 99.9 values to be replaced with NULL.
- Codes were checked for 99 values to be replaced with NULL.
- Decl_deg (degrees) was constructed from the original Decl column