UCAC4 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.
- watch for nulls, often defined as a number but referenced elsewhere.
    - 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.
- Adapt Sao2000 code to be more flexible.
- Four tables: ucac4 and ucac4_errors_flags & ucac4_not_visible and ucac4_errors_flags_not_visible
    - _not_visible: Not visible from Keck Observatory Declination < -70°
- Check database vs existing file query structure.

Tables

ucac4			
ColumnName	**Datatype**	**Units**	**NullValues**
UCAC_ID	INT	-	-
2MASS_ID	INT	-	-
RA	VARCHAR	sexag	-
Decl	VARCHAR	sexag	-
RA_deg	FLOAT	deg	-
Decl_deg	FLOAT	deg	-
RA_orig	INT	-	-
Decl_orig	INT	-	-
MagModel	FLOAT	mag	-
MagApperature	FLOAT	mag	-
Objt	INT	-	-
Cdf	INT	-	-
SigRA	INT	-	-
SigDec	INT	-	-
CepRA	INT	-	-
CepDec	INT	-	-
PmRA	FLOAT	mas/yr	-
PmDec	FLOAT	mas/yr	-
SigPmRA	INT	-	-
SigPmDec	INT	-	-
2MASS_J	FLOAT	mag	20
2MASS_H	FLOAT	mag	20
2MASS_K	FLOAT	mag	20
APASS_B	FLOAT	mag	20
APASS_V	FLOAT	mag	20
APASS_g	FLOAT	mag	20
APASS_r	FLOAT	mag	20
APASS_i	FLOAT	mag	20

ucac4_errors_flags			
ColumnName	Datatype	Units	NullValues
UCAC_ID	INT	id	-
SigMag	INT	-	-
Na1	INT	-	-
Nu1	INT	-	-
Cu1	INT	-	-
icqflg_J	INT	-	-
icqflg_H	INT	-	-
icqflg_K	INT	-	-
e2mpho_J	INT	-	-
e2mpho_H	INT	-	-
e2mpho_K	INT	-	-
APASS_B_err	INT	-	99
APASS_V_err	INT	-	99
APASS_g_err	INT	-	99
APASS_r_err	INT	-	99
APASS_i_err	INT	-	99
gcflg	INT	-	-
icf	INT	-	-
leda	INT	-	-
x2m	INT	-	-
zn2	INT	-	-
rn2	INT	-	-

Figures 2.1 & 2.2: Name, SQL Datatype, Units and Values to be replaced with NULL for the ucac4 and ucac4_errors_flags tables.

Database Implementation

- The UCAC4 database was constructed from nine hundred zone files, each corresponding to a 0.2-degree wide declination zone in the sky.
- Each file had anywhere between a few hundred and a few hundred thousand stars, with the data for each star stored in byte format and manipulated to meet certain storage criteria.
- UCAC4 requires more cleaning to acquire the desired database column format.
- These longer formats can be implemented, for example, changing RA from an integer to sexagesimal format, due to the increased performance of MySQL when compared to a simple file search.

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.
- Decl_deg (degrees) was constructed from the original Decl column.
- CepRA and CepDec, the epoch years for RA and Dec, were divided by one thousand and added to 1900 to get the epoch in years. Epoch was originally stored as a fraction of years before or after 1900.
- All magnitudes were divided by one thousand to get units of magnitude and not milimag and updated with NULL values.
    - MagModel
    - MagAperture
    - 2MASS_J
    - 2MASS_H
    - 2MASS_K
    - APASS_B
    - APASS_V
    - APASS_g
    - APASS_r
    - APASS_i