TAT Database Program Manual

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1 Description of Database *TAT*

- Database *TAT* records data for Taiwan Automated Telescope.
- Database *TAT* contains three tables:
  targets, data_file, observatory

1.1 Table *targets*

- Table *targets* shows information of the targets for observation.
- Table *targets* contains the following keys:
  ID, NAME, RA(deg), DEC(deg), RA, DEC, MAGNITUDE, PERIOD, TYPE, BFE0, F0, BFE1, F1, BFE2, F2, BFE3, F3, BFE4, F4, BFE5, F5, BFE6, F6
- The meaning of each key is:
  - **ID** is the identification number for every data and it is unique.
  - **NAME** is the name of target and it is unique.
  - **RA(deg)** is the right ascension of the target and its unit is degree.
  - **DEC(deg)** is the declination of the target and its unit is degree.
  - **RA** is the right ascension of the target and its type is HH:MM:SS.
  - **DEC** is the declination of the target and its type is DEG:ARCMIN:ARCSEC.
  - **MAGNITUDE** is the cataloged relative magnitude of the target.
  - **PERIOD** is the period of magnitude oscillation.
  - **TYPE** is the type of target. Example: star, galaxy...
  - **BFE0,1,2,3,...** is the best exposure time for filter 0,1,2,3,...
  - **F0,1,2,3,...** is the filter 0,1,2,3,...
- The following table is an example:

Table 1: Example for table *targets*

ID	NAME	RA(deg)	DEC(deg)	RA	DEC	MAGNITUDE	PERIOD	TYPE	BFE0	F0	BFE1	F1	BFE2	F2	BFE3	F3	BFE4	F4	BFE5	F5
1	IC5146	328.35	47.266	21:53:24	47:16:00	0	0	star	0	A	0	B	0	C	0	N	0	R	0	V

1.2 Table *data_file*

- Table *data_file* shows the information of images.
- Table *data_file* contains the following keys:
  ID, FILENAME, FILEPATH, FILTER, RA(deg), DEC(deg), RA, DEC, SITENAME, CCDTEMP, EXPTIME, DATE-OBS, TIME-OBS, MJD-OBS, AIRMASS, JD, SUBBED, DIVFITTED

- The meaning of each key is:
  - **ID** is the identification number for every data and it is unique.
  - **FILENAME** is the filename of image and it is unique.
  - **FILEPATH** is the path of data file.
  - **FILTER** is the one of filters in the band A, B, C, N, R, or V.
  - **RA(deg)** is the right ascension of the center of image and its unit is degree.
  - **DEC(deg)** is the declination of the center of image and its unit is degree.
  - **RA** is the right ascension of the center of image and its type is HH:MM:SS.
  - **DEC** is the declination of the center of image and its type is DEG:ARCMIN:ARCSEC.
  - **SITENAME** is the location of site.
  - **CCDTEMP** is the CCD temperature.
  - **EXPTIME** is the exposure time.
  - **DATE-OBS** is the date and its type is YYYY/MM/DD.
  - **TIME-OBS** is the observation time and its type is HH:MM:SS.SS
  - **MJD-OBS** the Modified Julian Date.
  - **AIRMASS** provides the condition to compare.
  - **JD** is the Julian Date.
  - **SUBBED** if the file has been subbed or not.
  - **FLATDIVED** if the file has been divided by flat or not.
- The following table is an example:

Table 2: Example for table *data_file*

ID	FILENAME	FILEPATH	FILTER	RA(deg)	DEC(deg)	RA	DEC	SITENAME	CCDTEMP	EXPTIME	DATE-OBS	TIME-OBS	MJD-OBS	AIRMASS	JD	subbed	divfitted
1	AStarTF20180705_215223.fit	/home2/TAT/data/raw/TF/image/20180705	A	0	0	19:20:30	11:02:01	TF	-16.2883	600	2018-07-05	21:52:23.26	58304.918345	NULL	2458305.41834	0	0
2	AStarTF20180705_221349.fit	/home2/TAT/data/raw/TF/image/20180705	A	0	0	19:20:30	11:02:01	TF	-30.0856	600	2018-07-05	22:13:49.26	58304.933229	NULL	2458305.43323	0	0
3	AStarTF20180705_223518.fit	/home2/TAT/data/raw/TF/image/20180705	A	0	0	19:20:30	11:02:01	TF	-30.0385	600	2018-07-05	22:35:18.26	58304.94816	NULL	2458305.44816	0	0
4	AStarTF20180705_225646.fit	/home2/TAT/data/raw/TF/image/20180705	A	0	0	19:20:30	11:02:01	TF	-30.0605	600	2018-07-05	22:56:46.26	58304.963056	NULL	2458305.46306	0	0

1.3 Table *observatory*

- Table *observatory* contains the following key:
  ID, SITENAME, SITELAT, SITELONG, SITEALT
- The meaning of each key:
  - **ID** is the identification number for data and it is unique.
  - **SITENAME** is the location of observatory and it is unique.

- **SITELAT** is the latitude of the observatory.
- **SITELONG** is the longitude of the observatory.
- **SITEALT** is the altitude of the observatory.

- The following table is an example:

Table 3: Table *observatory*

ID	SITENAME	SITELAT	SITELONG	SITEALT
1	TF	28.30	-16.51	2300
2	LI-JIANG	26.69	100.03	3330

2 Program *TAT_database_update*

- This program updates the data of images which saved in the path written in the file *back_up_path.txt* in database *TAT*

2.1 Pre-requirements

- This program uses python 2.7.11 and mysql in CentOS 7.

  1. Install python with:
     `yum install python2`
  2. Install python-pip with:
     `yum install epel-release`
     `yum install python-pip`
  3. Install MariaDB
     (1) Install MariaDB with yum:
     `yum install mariadb-server mariadb`
     (2) After the installation are completed, start MariaDB with:
     `systemctl start mariadb`

2.2 Install this program *TAT_database_update*

- Download this program and follow the steps to install.

  1. Download from github, using this command:
     `git clone https://github.com/yun-yan/TAT_db`
  2. Create the database *TAT*, using the command:
     `mysql < TAT_create_db.sql`
  3. Install the modules for the file *update_to_TAT_db.py*, the command:
     `pip install -r requirements.txt`
  4. Let the file *update_to_TAT_db.py* be used in anywhere, the command:
     `make install`

2.3 Running

- Insert the data of images stored in the path written in the file *back_up_path.txt* to database *TAT* with this command:
  `update_to_TAT_db.py`

2.4 Source Files

- The files are located in the path `/home2/TAT/program/TAT_database`
- It contains the following files:
  - **INSTALL** is the simple manual which describes how to install and execute.
  - **README.md** illustrates what this program can do.
  - **back_up_path.txt** contains the path you want to process.
  - **update_to_TAT_db.py** inserts the data of images in the path written into file *back_up_path.txt* to database *TAT*.
  - **Makefile** is the convenient file to provide to use the command `make`
  - **TAT_create_db.sql** is the file to create the database *TAT*.
  - **requirement.txt** provides the modules for installation.
  - **log.txt** records the path already checked.

2.5 Authority

- *TAT@localhost* has the privileges of selecting and modifying the database *TAT*, and its password is 1234
- *read@localhost* has the only privilege of selecting database *TAT*, and its password is 1234

2.6 Uninstall

- Remove the file *update_to_TAT_db.py* from `/usr/local/bin` with this command:
  ```
  make uninstall
  ```
- Clean the log from *log.txt* with:
  ```
  make clean
  ```
- Remove the database *TAT*, following the steps:
  1. Enter mysql with this command:
     ```
     mysql
     ```
  2. Delete the database *TAT* with this command:
     ```
     drop database TAT;
     ```