BADA for Traffic Complexity

Traffic Complexity Score uses BADA coefficients for aircraft performance.

The scripts in this directory are used to extract the aircraft performance parameters in a CSV file that can then be imported in the relevant ORACLE schema.

Please note that all scripts are version controlled under git and hosted on Github at the following URL:

https://github.com/euctrl-pru/bada4trafficcomplexity

Should you need any changes, please submit a pull request.

Prerequisites and Setup

You need to set the following environment variable for the relevant DB connection:

- `PRU_OGIS_USR`: the username for the Oracle GIS database
- `PRU_OGIS_PWD`: the password for the Oracle GIS database
- `PRU_OGIS_DBNAME`: the databse name for the Oracle GIS database

The scripts also rely on running versions of `awk`, `unzip`, a shell (`bash` or MS Windows `cmd`) and Oracle SQL Loader if you decide to use it to import CSV files.

You can either run a Unix script `.sh` or a MS Windows batch script `.bat`.

Extract BADA dataset

Extract the BADA zip in a folder named `bada`

```
$ unzip -d bada /e/Bada/bada_314.zip
```

The `bada` folder should now contains a set of files like:

```
$ ls -l bada/
total 6580
-rw-r--r-- 1 spi 1049089  2547 May 13  2013 A124__.APF
-rw-r--r-- 1 spi 1049089  4453 May 13  2013 A124__.OPF
-rw-r--r-- 1 spi 1049089 14376 May 22  2013 A124__.PTD
-rw-r--r-- 1 spi 1049089  5401 May 22  2013 A124__.PTF
-rw-r--r-- 1 spi 1049089  2547 May 15  2013 A140__.APF
-rw-r--r-- 1 spi 1049089  4453 May 15  2013 A140__.OPF
-rw-r--r-- 1 spi 1049089 10208 May 22  2013 A140__.PTD
-rw-r--r-- 1 spi 1049089  4087 May 22  2013 A140__.PTF
...
...
-rw-r--r-- 1 spi 1049089  2547 May  7  2013 YK40__.APF
-rw-r--r-- 1 spi 1049089  4453 Aug 22  2014 YK40__.OPF
-rw-r--r-- 1 spi 1049089 10729 Aug 25  2014 YK40__.PTD
-rw-r--r-- 1 spi 1049089  4251 Aug 25  2014 YK40__.PTF
-rw-r--r-- 1 spi 1049089  2547 May  7  2013 YK42__.APF
-rw-r--r-- 1 spi 1049089  4453 May  7  2013 YK42__.OPF
-rw-r--r-- 1 spi 1049089 12292 May 22  2013 YK42__.PTD
-rw-r--r-- 1 spi 1049089  4743 May 22  2013 YK42__.PTF
```

Sanity check

In order to make sure that there is no spurious data file or that the file format has not changed, you need to run the `sanity_check_PTF.awk` script

```
$ ./sanity_check_PTF.awk bada/*.PTF
1 TBM8__ ==================================================
1 YK40__ ==================================================
```

```
1 YK42__ ================================================

There is something fishy in the PTF files!
$ echo $?
1
```

The erroneus rows will be printed on `stderr` and exit status would then be `1`. Otherwise if all is ok exit status will be `0`:

```
$ ./sanity_check_PTF.awk bada/*.PTF
$ echo $?
0
```

Prepare the dataset for ORACLE

The following command will extract the relevant aircraft performance parameters in CSV format:

```
$ awk -f convertPTF.awk -v ver=3.14 bada/*.PTF > bada_ptf.csv
$ echo $?
0
$ awk -f convertSYN.awk -v ver=3.14 bada/SYNONYM.NEW > bada_syn.csv
$ echo $?
0
```

The outcome is similar to the following:

```
$ head bada_ptf.csv
AC_TYPE,FL,CRUISE_TAS,CRUISE_FUEL_LO,CRUISE_FUEL_NO,CRUISE_FUEL_HI,CLIMB_TAS,CLIMB_ROCD_LO,CLIMB_ROCD_N
A124__,0,,,,,171,2204,1385,975,476.2,156,869,116.1,3.14
A124__,5,,,,,173,2202,1380,968,473.6,157,878,115.5,3.14
A124__,10,,,,,174,2201,1375,961,470.9,163,861,114.6,3.14
A124__,15,,,,,180,2304,1440,1012,467.2,175,829,113.4,3.14
A124__,20,,,,,182,2301,1434,1004,464.5,207,1261,110.2,3.14
A124__,30,230,143.3,197.3,246.7,205,2666,1661,1183,454.6,230,1375,108.6,3.14
A124__,40,233,143.0,197.0,246.4,240,3067,1884,1343,442.4,233,1397,106.9,3.14
A124__,60,272,160.7,201.9,239.6,272,3319,1925,1313,425.6,272,1841,103.6,3.14
A124__,80,280,159.8,200.9,238.6,280,3259,1872,1259,413.6,280,1890,100.3,3.14
```

Import to ORACLE

You can use TOAD or SQL Developer to load the CSV files in the relevant tables.

Otherwise import scripts and support files for SQL Loader can be generated via SQL Developer as described in this post.

The files `bada_ptf.sh` (for Windows `bada_ptf.bat`) and `bada_ptf.ctl` are an example for the `PTF` values.

If you want to reuse them, **Please change the relevant filepath in order to accomodate for the actual location of the CSV and log files and/or ORACLE table.**

In order to import the `bada_ptf.csv` and `bada_syn.csv` it then suffice to execute

```
$ ./bada_ptf.sh
$ ./bada_syn.sh
```

Please check the *log* files for any errors.